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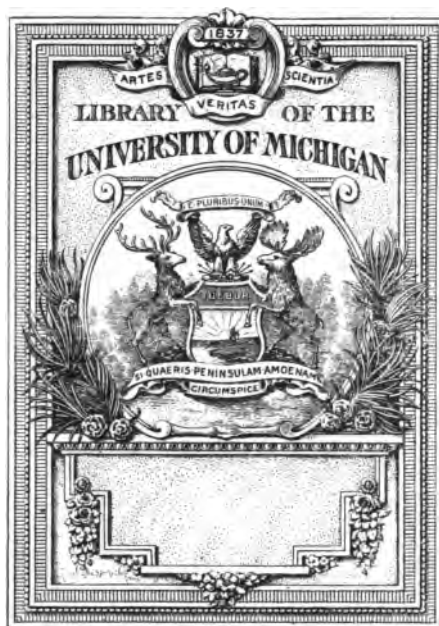
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# JOURNAL

OF THE

AMERICAN GEOGRAPHICAL SOCIETY

OF

NEW YORK.

M.DCCC.LXXV



VOL. VII.

JEROME B. PARMENTER, STATE PRINTER.  
1878.



# STATE OF NEW YORK.

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No. 62.

IN SENATE,

April 27, 1876.

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ANNUAL REPORT

OF THE

AMERICAN GEOGRAPHICAL SOCIETY FOR THE  
YEAR 1875.

AMERICAN GEOGRAPHICAL SOCIETY,  
COOPER INSTITUTE, NEW YORK, *April 22, 1876.* }

HON. WILLIAM DORSHEIMER,

*President of the Senate of the State of New York:*

SIR. — In conformity with the provisions of the act incorporating this Society, I have the honor to transmit herewith the annual report of the American Geographical Society for the year 1875.

Very respectfully yours.

(Signed) CHARLES P. DALY,  
*President.*



# AMERICAN GEOGRAPHICAL SOCIETY.

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## COUNCIL, 1875.

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### OFFICERS.

PRESIDENT,

CHARLES P. DALY.

VICE-PRESIDENTS,

FREDERICK A. CONKLING,

FRANCIS A. STOUT,

GEORGE W. CULLUM.

FOREIGN CORRESPONDING SECRETARY,

JAMES MÜHLENBERG BAILEY,

DOMESTIC CORRESPONDING SECRETARY,

WILLIAM H. H. MOORE.

RECORDING SECRETARY,

ALVAN S. SOUTHWORTH,

TREASURER,

GEORGE CABOT WARD.

COUNCILORS,

WILLIAM REMSEN,

E. R. STRAZNICKY,

T. BAILEY MYERS,

ISAAC BERNHEIMER,

WILLIAM TILDEN BLODGETT,

ROSWELL D. HITCHCOCK,

WILLIAM E. CURTIS,

SAMUEL L. M. BARLOW,

THEODORE W. DWIGHT,

HARLOW M. HOYT,

ELIAL F. HALL,

H. MANIGAULT MORRIS,

WILLIAM JONES HOPPIN,

CHARLES A. JOY,

WALTON W. EVANS.



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ANNUAL REPORT  
OF THE  
AMERICAN GEOGRAPHICAL SOCIETY.

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*To the Honorable the Legislature of the State of New York:*

The undersigned beg leave to present this, their Seventh Annual Report, for the year 1875, in accordance with the provisions of the act of April 8, 1871. It contains the list of officers, the annual report of its Council, and the papers read before it, which embrace a large amount of new and valuable geographical information, especially in relation to our own country.

Respectfully submitted.

CHAS. P. DALY,

*President.*

ELIAL F. HALL,

*Recording Secretary.*

## CHARTER OF INCORPORATION.

---

GRANTED APRIL 13TH, 1854.

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*The People of the State of New York, represented in Senate and Assembly, do enact as follows :*

SECTION 1. George Bancroft, Henry Grinnell, Francis L. Hawks, John C. Zimmerman, Archibald Russell, Joshua Leavitt, William C. H. Waddell, Ridley Watts, S. DeWitt Bloodgood, M. Dudley Bean, Hiram Barney, Alexander J. Cotheal, Luther B. Wyman, John Jay, J. Calvin Smith, Henry V. Poor, Cambridge Livingston, Edmund Blunt, Alexander W. Bradford, and their associates, who are now or may become hereafter associated for the purposes of this act, are hereby constituted a body corporate by the name of the American Geographical and Statistical Society, for the purpose of collecting and diffusing geographical and statistical information.

§ 2. For the purposes aforesaid, the said Society shall possess the general powers and privileges, and be subject to the general liabilities contained in the third title of the eighteenth chapter of the first part of the Revised Statutes, so far as the same may be applicable, and may not have been modified or repealed ; but the real and personal estate which the said Society shall be authorized to take, hold and convey, over and above its library and maps, charts, instruments and collections, shall not at any time exceed an amount the clear yearly income of which shall be ten thousand dollars.

§ 3. The officers of the said Society shall be a president, three vice-presidents, a corresponding secretary, a recording secretary, a librarian, and treasurer, and such other officers as may from time to time be provided for by the by-laws of the said Society.

§ 4. The said Society, for fixing the terms of admission of its members, for the government of the same, for changing and altering the officers above named, and for the general regulation and management of its transactions and affairs, shall have power to form a code of by-laws not inconsistent with the laws of this State or of the United States ; which code, when formed and adopted at a regular meeting,

shall, until modified or rescinded, be equally binding as this act upon the said society, its officers and its members.

§ 5. The Legislature may at any time alter or repeal this act.

§ 6. This act to take effect immediately.

STATE OF NEW YORK, }  
Secretary's Office. }

I have compared the preceding with the original law on file in this office, and hereby certify the same to be a correct transcript therefrom and of the whole of said original law.

Given under my hand and seal of office, at the city of Albany, this thirteenth [L. s.] day of April, one thousand eight hundred and fifty-four.

A. G. JOHNSON,  
*Deputy Secretary of State.*

## AMENDED CHARTER.

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PASSED APRIL 8TH, 1871.

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STATE OF NEW YORK, No. 237, IN SENATE, *March 7, 1871.* — Introduced by unanimous consent by Mr. Bradley; read twice and referred to the Committee on Literature; reported favorably from said committee, and committed to the Committee of the Whole.

## CHAP. 373.

AN ACT in relation to The American Geographical and Statistical Society.

PASSED April 8th, 1871.

*The People of the State of New York, represented in Senate and Assembly, do enact as follows :*

SECTION 1. The name or corporate title of the said Society shall hereafter be, "The American Geographical Society of New York."

§ 2. The objects of the said Society shall be the advancement of geographical science; the collection, classification and scientific arrangement of statistics, and their results; the encouragement of explorations for the more thorough knowledge of all parts of the North American continent, and of other parts of the world which may be imperfectly known; the collection and diffusion of geographical, statistical and scientific knowledge by lectures, printed publications or other means; the keeping up of a correspondence with scientific and learned societies in every part of the world, for the collection and diffusion of information, and the interchange of books, charts, maps, public reports, documents and valuable publications; the permanent establishment in the city of New York of an institution in which shall be collected, classified and arranged, geographical and scientific works, voyages and travels, maps, charts, globes, instruments, documents, manuscripts, prints, engravings, or whatever else may be useful or necessary for supplying full, accurate and reliable information in respect to every part of the globe, or explanatory of its geography, physical and descriptive; and its geological history, giving its climatology, its productions, animal, vegetable and mineral;

its exploration, navigation and commerce; having especial reference to that kind of information which should be collected, preserved, and be at all times accessible for public uses in a great maritime and commercial city.

§ 3. The power given by the act hereby accorded to the said Society, to take, hold, convey manage and make use of its real and personal estate, shall be understood as authorizing said Society to take and hold by gift, grant, bequest, devise, subject to all provisions of law relative to devises and bequests by last will and testament, or purchase real estate to the value of three hundred thousand dollars, and to invest its income, or its personal estate generally, so as to produce a regular annual income sufficient for the accomplishment of the purposes set forth in the first section of this act; but said annual income shall not exceed twenty-five thousand dollars annually.

§ 4. The said Society shall make an annual report of its proceedings to the Legislature.

---

STATE OF NEW YORK, }  
Office of Secretary of State, } ss.:

I have compared the preceding with the original law on file in this office, and do hereby certify that the same is a correct transcript therefrom, and of the whole of said original law.

Given under my hand and seal of office, at the city of Albany, this twenty-  
[L. s.] second day of May in the year one thousand eight hundred and seventy-one.

DIEDRICH WILLERS, JR.,  
*Deputy Secretary of State.*

## BY-LAWS.

---

REVISED JANUARY 19TH, 1874.

---

## CHAPTER I.

## TITLE.

The title of the Society is, "The American Geographical Society."

## CHAPTER II.

## OBJECTS.

The objects of the Society are, "The collecting and diffusing of geographical and statistical information."

## CHAPTER III.

## MEMBERS.

1. The Society shall consist of fellows, honorary, corresponding and *ex-officio* members.

2. Honorary members shall be chosen on account of their distinction in the science of geography or statistics, and not more than twelve of them shall hereafter be elected in any one year.

3. Corresponding members shall be chosen from those who have aided the advancement of geography or statistics.

4. *Ex-officio* members shall be foreign diplomatic representatives and consuls, resident in the United States, and United States diplomatic representatives and consuls in foreign countries.

5. Fellows, and corresponding and honorary members shall be elected as follows: All nominations of candidates shall be openly made in writing at a meeting of the Society or the Council by a member thereof, and, together with the name of the member making them, entered on the minutes. The persons thus nominated, when approved by the Council and elected by the Society, shall, on payment of the initiation fee, if nominated as fellows, and without such payment, if nominated as corresponding or honorary members, become members of the Society accordingly.

6. Persons entitled to become *ex-officio* members of the Society shall, on the recommendation of the Council, be, by the Society, constituted and declared to be such members.

7. The name of any member of the Society may, on the recommendation of the Council, and by a vote of two-thirds of the members present at a stated meeting of the Society, be dropped from the roll of its members.

## CHAPTER IV.

### INITIATION FEE AND ANNUAL DUES.

1. The initiation fee, including the dues for the current year, shall be, for a fellow, ten dollars to be paid immediately on election.

2. The annual dues thereafter shall be, for a fellow, five dollars to be paid in advance.

3. Any fellow of the Society not in arrears may commute for life all dues for fellowship by the payment at one time, if a fellow, of \$100.

4. The name of any fellow of the Society neglecting for two successive years to pay his annual dues, or at any time wholly refusing to pay them, may, by the Council, be erased from the list of fellows of the Society.

5. The fiscal year of the Society shall, for all purposes, be the calendar year, that is, commence on the first day of January and end with the thirty-first day of December in each year.

## CHAPTER V.

### OFFICERS.

1. The officers of the Society shall be a president, three vice-presidents, a foreign corresponding secretary, a domestic corresponding secretary, a recording secretary, a treasurer and fifteen councilors; and these officers together shall form the Council of the Society.

2. The officers of the Society shall be chosen from among its members; they shall be elected annually by ballot and shall hold their offices respectively until others are elected in their places.

3. All officers of the Society to be chosen at any election may be voted for on one ballot.

## CHAPTER VI.

### ANNUAL MEETING.

1. The annual meeting of the Society shall be held on the second Tuesday after the first day of January in each and every year hereafter, when the annual election of the officers of the Society shall take place; and if, from any cause, there shall be a failure of the annual election at the time above designated for that purpose, the

same may be held on the Tuesday next following, that is, on the third Tuesday after the first day of January in each year, and of which due notice shall be given.

2. Every member of the Society, who has been such for twenty days or more, and who is not in arrears for his dues for the past year, shall be entitled to vote at the said election.

3. At the annual meeting of the Society, the Council shall present a general report of its proceedings, and of those of the Society during the past year; and the secretaries and treasurer shall also present their annual reports.

## CHAPTER VII.

### MONTHLY AND SPECIAL MEETINGS.

1. The Society, unless otherwise specially ordered by the Society or the Council, shall hold its stated meetings for the transaction of business on the second Tuesday of each month of the year, except July, August and September.

2. The president, or, in his absence, one of the vice-presidents, may, and upon the written request of five members, shall call a special meeting of the Society, by giving three days' notice thereof in two daily newspapers published in the city of New York.

## CHAPTER VIII.

### ORDER OF BUSINESS.

1. At all stated meetings of the Society, for the transaction of ordinary business, the order of proceedings shall be as follows:

1. Reading of the minutes.
2. Reports and communications from officers of the Society.
3. Reports from the Council.
4. Reports from committees.
5. Nominations of members.
6. Special orders.
7. Unfinished business.
8. Miscellaneous business.
9. Papers read and addresses delivered before the Society.

2. All propositions presented for the action of the Society, at any of its meetings, shall be in writing, when requested by the presiding officer or any member. A proposition thus presented, when seconded, and the question thereon stated from the chair, shall be deemed to be in the possession of the Society, and open for discussion; but may be withdrawn by the mover, at any time before amendment or decision.



3. No member shall speak more than once upon the same question until all the other members present, desiring to speak, shall have spoken; nor more than twice on any question without leave of the Society.

## CHAPTER IX.

### QUORUM.

At all meetings of the Society, nine members present shall constitute a quorum for the transaction of business.

## CHAPTER X.

### COMMITTEES.

All committees, authorized by the Society, shall, unless otherwise specially ordered, consist of three members each, and be appointed by the presiding officer.

## CHAPTER XI.

### PRESIDING OFFICER.

At all meetings of the Society, on the arrival of the appointed hour, and the presence of a quorum, the president, or, in his absence, one of the vice-presidents, or, in the absence of both, a chairman *pro tem.*, shall immediately take the chair, call the meeting to order, and preside. He shall have only a casting vote. He shall preserve order and decide all questions of order, subject to an appeal to the Society. He shall also, unless otherwise specially ordered, appoint all committees authorized by the Society; and, at every annual election, before the opening of the polls, he shall appoint two tellers of the election.

## CHAPTER XII.

### SECRETARIES.

1. Foreign Corresponding Secretary. — It shall be the duty of the foreign corresponding secretary to conduct the general correspondence of the Society with individuals and associate bodies in foreign countries.

2. Domestic Corresponding Secretary. — It shall be the duty of the domestic corresponding secretary to conduct the Society's general correspondence with individuals and associate bodies in the United States.

3. Both the foreign and domestic secretaries shall keep, in suitable books to be provided for that purpose, at the Society's rooms, true

copies of all letters written by them respectively on behalf of the Society ; and shall preserve on proper files, at the said rooms, all letters received by them on the same account ; and at each stated meeting of the Society or the Council they shall respectively report their correspondence and read the same, or such parts thereof as may be required.

4. In case of a vacancy in the office of either of the corresponding secretaries, or in the absence or disability of either of these officers, the duties of both may be performed by the other corresponding secretary.

5. The Society may designate a particular officer, or appoint a committee to prepare a letter or letters on any special occasion.

6. Recording Secretary. — It shall be the duty of the recording secretary to give due notice of the time and place of all meetings of the Society, and to attend the same. He shall keep fair and accurate minutes of the proceedings of the Society, and record the same, when approved, in the Society's Journal. He shall give immediate notice to the several officers and committees of the Society of all votes, orders, resolves and proceedings of the Society, affecting them or appertaining to their respective duties. He shall prepare a list of the members of the Society entitled to vote, to be handed to the tellers before the opening of the polls at each annual election. He shall officially sign and affix the corporate seal of the Society to all diplomas and other instruments or documents authorized by the Society or Council. He shall have charge of the corporate seal, charter, by-laws, records and general archives of the Society, except so far as they may be expressly placed under the charge of others. He shall certify all acts and proceedings of the Society, and shall notify the Council of the death, resignation or removal of any officer or member of the Society. He shall have charge of the rooms of the Society, and shall perform all such other and further duties as may from time to time be devolved upon him by the Society or the Council. He shall receive for his services such salary or pecuniary compensation as shall be determined by the Society or the Council ; but neither in the Society nor the Council shall he have a vote on any question relating to or affecting his salary or pecuniary compensation. He, together with the Council, shall have the charge and arrangement of the books, maps and collections belonging to the Society. He shall cause to be kept in the rooms of the Society a registry of all donations to the library or collections of the Society, acknowledge

their receipt by letter to the donors, and report the same, in writing, to the Society at its next stated meeting.

7. All documents relating to the Society, and under the charge of the secretaries respectively, shall be placed in such depositories in the rooms of the Society as the Council may provide and designate for that purpose.

## CHAPTER XIII.

### TREASURER.

The treasurer shall have charge of, and safely keep, all contracts, certificates of stock, securities, and muniments of title belonging to the Society. He shall collect the dues and keep the funds of the Society, and disburse the same under the direction of the Council; and so often as the said funds in the hands of the treasurer shall amount to one hundred dollars, he shall deposit the same, in the name of the Society, in some incorporated bank in the city of New York, to be designated for that purpose by the Council; and the said funds, thus deposited, shall be drawn out of the said bank on the check of the treasurer, countersigned by the chairman of the Council, and only for the legitimate and authorized purposes of the Society. The treasurer shall, previous to the annual meeting of the Society, prepare and submit to the Council, for audit, a detailed account of his receipts and disbursements for account of the Society during the past year; and which annual account duly audited, he shall present, with his general report, to the Society, at its annual meeting.

## CHAPTER XIV.

### COUNCIL.

1. The Council shall have the management and control of the affairs, property, and funds of the Society; and shall designate an incorporated bank in the city of New York, where the said funds shall, from time to time as they accrue, be deposited by the treasurer.

2. It may frame its own by-laws not inconsistent with the charter or by-laws of the Society.

3. It may, from time to time, determine the salary or pecuniary compensation of the recording secretary; and shall also appoint the necessary agents, clerks and servants of the Society, with such powers, duties, privileges, and compensation as it may, from time to time, determine; and may, at pleasure, revoke such appointments, and make others in their stead.

4. It shall have power to fill, for the unexpired term, any vacancy that may occur in any of the offices of the Society.

5. It shall have power, at its discretion, to declare vacant the seat of any member of its own body (except the president and vice-presidents) who shall have been absent from its meetings for three successive months; and also, by a vote of a majority of the whole Council, to remove, from its own body, any member thereof for cause; but in such case it shall be the duty of the Council to report every such vacancy or removal to the Society, at its next stated meeting thereafter, when such cases shall be subject to review by the Society.

6. It shall not, without an approving vote of the Society, at a stated meeting thereof, make any contract whereby a liability in amount above one thousand dollars may be incurred by the Society; nor, without such vote, make any sale or disposition of the property of the Society, exceeding that sum in value.

7. The Council may, in its discretion, remit the initiation fee, or annual dues, of any member of the Society.

8. No member of the Council, except the recording secretary, shall receive any salary or pecuniary compensation for his services.

9. The Council shall hold stated meetings for the transaction of business, at least once in every month, except the months of July, August and September.

10. At all meetings of the Council, five members present shall constitute a quorum for the transaction of business.

## CHAPTER XV.

### GENERAL PROVISION AS TO DEBT.

No debt on account of the Society, beyond the funds in the treasury for its payment, shall, for any purpose, at any time, be incurred; and if, at any time, it shall appear that there are resting upon the society pecuniary obligations beyond the funds in the treasury for their liquidation, no appropriation of funds from the treasury whatever, except for the necessary current expenses of the Society, shall be made until the said pecuniary obligations shall be fully discharged, or the funds necessary for their extinction shall have been set apart for that purpose.

## CHAPTER XVI.

### ALTERATION OF THE BY-LAWS.

No alteration in the by-laws of the Society shall be made unless openly proposed at a stated meeting of the Society, entered on the

minutes, with the name of the member proposing the same, and adopted by the Society at a subsequent stated meeting by a vote of two-thirds of the members present.

## CHAPTER XVII.

### ADOPTION OF THE BY-LAWS.

The foregoing are hereby adopted and declared to be the by-laws of the Society; and all by-laws of the Society heretofore adopted are hereby rescinded, and declared to be null and void.

## HONORARY, CORRESPONDING, AND FELLOW MEMBERS.

### HONORARY MEMBERS.

BAKER, Sir Samuel White, Pasha, F. R. S., London, England.	MCCCLINTOCK, Francis Leopold, LL. D., London, England.
BAKER, Lady, London, England.	MIDDENDORFF, Adolph Theodore von, Secretary of the Imperial Academy of Sciences of Russia, St. Petersburg.
His Imperial Highness, the Grand Duke Constantine of Russia, President of the Imperial Geographical Society, St. Petersburg, Russia.	PETERMANN, Professor Augustus, Ph. D., Gotha, Germany.
ISMAIL, H. I. M. Pasha, Khedive, of Egypt.	RAWLINSON, Sir Henry Creswick, D. C. L., London, England.
LAYARD, Austin Henry, D. C. L., London, England.	STRUVE, Otto Wilhelm von, St. Petersburg, Russia.
MARKHAM, Clements R., C. B., Secretary of the Royal Geographical Society, London, England.	WILCZEK, Count H., Vienna, Austria.

### CORRESPONDING MEMBERS.

ABBE, Prof. Cleveland, Cincinnati, Ohio.	BUSHNELL, Albert (Rev.), Gaboon, Equatorial Africa.
ALVORD, Gen. Benjamin, U. S. A., Washington, D. C.	CARLOS, Senor Don Jose, Washington, D. C.
ALTAMIRANO, Senor Don Ignacio, Mexico.	CHAIX, Prof. Paul, Geneva, Switzerland.
AMMEN, Commodore Daniel, U. S. N.	CIEROL, Senor Manuel, Mexico.
BAKER, Commodore, F. H., U. S. N., Norfolk, Va.	CHANDLESS, W., F. R. G. S., London, England.
BARANDA, Senor Joaquin, Mexico.	COLLINS, Lieut. Fred., U. S. N., Annapolis, Md.
BARCLAY, James T., M. D., Jerusalem, Syria.	DEHASS, Rev. F. S., U. S. Consul, Jerusalem.
BARNARD, Henry, LL. D., Hartford, Conn.	DAVIS, Thomas E., Rome.
BARTLETT, Jno. Russell, Providence, R. I.	DOW, Capt. J. M., Panama, C. A.
BASTIAN, Dr. A., Berlin.	DRAPER, Lyman, Madison, Wis.
BECKER, M. A., Vienna.	DUNCAN, William H. Hanover, N. H.
BEHM, Dr. E., Gotha.	EMORY, Gen. Wm. H., U. S. A., Washington, D. C.
BEEBE, C. G., Shanghai, China.	FOETTERLE, Franz, late Secretary of the Imperial Geographical Society of Vienna, Austria.
BOUDINOT, Col. E. C., Vanita, Cherokee Nation.	FRITSCH, Hugo O., New York.
BRAINE, Commander D. L., U. S. N.	
BRIGHT, John, M. P., London, England.	

- GARDNER, J. T., Washington, D. C.  
 GIBBS, Douglass, Alexandria, Egypt.  
 GILMAN, Daniel Coit, LL. D.  
 GUYOT, Prof. Arnold Henry, LL. D.,  
 Princeton, N. J.  
 HAGUE, J. D., Washington, D. C.  
 HANCOCK, Wm. Neilson, LL. D., Dublin,  
 Ireland.  
 HAYDEN, Prof. F. V., Washington, D. C.  
 HANSELL, Herr, Khartoum.  
 HEFTE, Thomas J., Consul, Christiana.  
 HELLWALD, Friedrich von, Member of the  
 Imperial Royal Geographical Society,  
 Vienna, Austria.  
 HITCHCOCK, C. H., Ph. D., Hanover,  
 N. H.  
 HOCHSTETTER, Dr. Ferdinand von, Pro-  
 fessor in the University of Vienna,  
 Austria.  
 HOSMER, Dr. Geo. W.  
 HOUGH, Franklin B., M. D.  
 HUMPHREYS, General A. A., U. S. A.,  
 Washington, D. C.  
 HUNT, Prof. T. Sterry, LL. D., Boston.  
 JACKSON, John P., Berlin.  
 KIRKHAM, General, Adowa, Abyssinia.  
 KING, Clarence, Washington, D. C.  
 LAPHAM, I. A., Milwaukee, Wis.  
 LAMANSKY, Eugene von, St. Petersburg,  
 Russia.  
 LESSEPS, Ferdinand de, Suez, Egypt.  
 LONG, Stephen H., U. S. A., Louisville,  
 Ky.  
 LUCE, Captain S. B., U. S. N.  
 LULL, Commander E. P., U. S. N., New-  
 port, R. I.  
 MCCARTEE, Divie Bethune, M. D., Hong  
 Kong, China.  
 MCLEAN, Wm. J., Bombay, India.  
 MALTE BRUN, V. A., Honorary Secretary  
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 France.  
 MARISCAL, Senor Don Ignacio, Mexico.  
 MARSH, Hon. George P., LL. D., U. S.  
 Minister, Rome, Italy.  
 MARTIN, Rev. Wm. A. P.; D. D., Pro-  
 fessor of the Imperial College, at Pekin,  
 China.  
 MAURY, Louis Ferdinand Alfred, Paris,  
 France.  
 MAUNOIR, Charles, Paris.  
 NAPRSTEK, Vojta, Prague, Austria.  
 NASSAU, Rev. R. H., Gaboon Africa.  
 NEGRI, Cristoforo, late President Italian  
 Geographical Society, Consul General  
 of Italy, Hamburg.  
 NEWMARCH, Wm., Hon Sec. of the Statis-  
 tical Society of London, England.  
 NORDENSKJÖLD, Prof. A. E. Stockholm.  
 PALAZIOS, Gen. Vincente, Riva, Mexico.  
 PARDO, Senor Don Emilio, Mexico.  
 PACHA, Ismail, Governor General of the  
 Soudan.  
 PAYNO, Senor Don Manuel, Mexico.  
 PERKINS, E. H.  
 PENNA, Senor Terreira, Para, Brazil.  
 PINHEIRO, J. C. Fernandes, M. D., Brazil.  
 PIMENTIL, D. Joaquin Xavier de Oliveria,  
 Satarem Para, Brazil.  
 POESCHE, Theodore, Washington, D. C.  
 RAE, John, M. D., Hamilton, Canada.  
 RAYMOND, Captain Charles W., U. S. A.,  
 West Point, N. Y.  
 RIO DE LA LOZA, Senor Don Leopoldo,  
 Mexico.  
 ROBERTS, Gen. W. M., New York.  
 ROMERO, Mathias, Mexico.  
 ROGERS, Rear Admiral John, U. S. N.  
 ROTHROCK, Dr. J. T., Wilkesbarre, Pa.  
 SAINT-MARTIN, Vivien de, Paris.  
 SAUER, George, Paris.  
 SAPUCACHY, M. Le Viscomte, Rio  
 Janeiro, Brazil.  
 SCHADE, Louis, M. D., Washington, D. C.  
 SCHLAGINTWEIT-SAKÜNLÜNNISKI, Robert  
 von, Giessen, Germany.  
 SCHLAGINTWEIT-SAKÜNLÜNNISKI, Her-  
 mann von, Munich, Germany.  
 SCHUMACHER, Herman A., Consul General,  
 New York.  
 SCHUYLER, Eugene, St. Petersburg,  
 Russia.  
 SCHUMACHER, John, Altona, Germany.  
 SELFRIDGE, Com. T. O., U. S. N., Wash-  
 ington, D. C.  
 SEYMOUR, Horatio, LL. D., Utica, N. Y.  
 SIMMONS, D. B., M. D., Yeddo, Japan.  
 STANLEY, Henry M., Ashantee.  
 STARRING, General F. A., Paris.  
 STEVENS, Henry, London, England.  
 STEERE, J. B., U. S. Consul, Hong Kong,  
 China.

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VAN BENTHUYSEN, Charles, Albany, New York.	WYMAN, Captain R. H., U. S. N., Washington, D. C.

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Abbot, James L.	Appleton, D. S.	Bard, Charles.
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Abbott, Josiah H.	Arnold, Daniel H. (L. F.)	Barlow, J. W.
Aborn, Robert W.	Arnold, Gustavus.	Barling, Henry A.
Acker, David D.	Arnold, Richard.	Barnard, F. A. P.
Acton, Thomas C.	Arnoux, William H.	Barnard, Horace.
Adams, Charles Francis.	Arthur, Chester A.	Barney, Hiram. (L. F.)
Adams, John P.	Asch, Joseph J.	Barney, Newcomb C.
Adams, Russell W.	Ascher, Adolph.	Barney, Charles T.
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Adams, M. B.	Astor, W. W.	Barnes, John S.
Adler, Felix.	Atkinson, William H.	Barrow, John W.
Adriance, John.	Atterbury, W. Wallace.	Barril, John J.
Agnew, Alexander McL.	Auchincloss, Henry B.	Barr, William.
Agnew, John T. (L. F.)	Auchmuty, Richard T.	Bartlett, Willard.
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Aikman, Samuel M.	Avery, Samuel P.	Battershall, S. W.
Aitken, William B.	Aymar, William. (L. F.)	Bates, Levi M.
Albert, Halpern.		Beach, Win. A.
Alexander, Charles B.	Babcock, O. E.	Beach, Miles.
Alexander, Junius B.	Backus, Henry C.	Beach, Henry N.
Alexander, James A.	Backarach, Herman.	Beaman, Charles C., Jr.
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Allen, Henry W.	Bailey, Edward.	Beardslee, J. B.
Allen, Jerome.	Bailey, N. P.	Beckwith, N. M.
Allen, Thomas.	Bailey, James M.	Beecher, Henry Ward.
Alliger, Elijah.	Baker, Peter C.	Beekman, James W.
Alsop, Joseph W.	Baker, James, Jr.	Beekman, Gerard.
Amend, Bernhard G.	Baker, Francis.	Beckwith, Leonard F.
Amidon, Francis H.	Baldwin, Townsend B.	Belding, Milo M.
Amy, Henry.	Baldwin, N. A.	Bell, Isaac.
Anderson, Henry H.	Baldwin, James M.	Bell, George.
Anderson, Henry F.	Ballin, Eugene S.	Bell, Clark.
Anderson, John H.	Ball, Henry.	Belknap, Robert L.
Andrews, George H.	Bancroft, George. (L. F.)	Belmont, August. (L. F.)
Andrews, Rufus F.	Bancroft, Benjamin F.	Bellows, Henry W.
Anthony, Edward.	Banks, David.	Benedict, Erastus C.
Anthony, Henry T.	Banvard, John.	Bennett, James Gordon.
Apgar, Louis J.	Banyer, Goldsboro.	Benjamin, John.
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Appleton, John A.	Barbey, A. H.	Benkard, James.



- Bentley, Andrew J.  
 Bergland, Eric.  
 Bernheimer, J. A.  
 Bernheimer, Adolph.  
 Bernheimer, Isaac.  
 Bernheimer, Simon.  
 Betts, William.  
 Berry, Richard.  
 Bickmore, Albert S.  
 Bien, Julius.  
 Bierstadt, Albert.  
 Bill, Edward.  
 Birdseye, Lucien.  
 Bishop, D. W. (L. F.)  
 Bishop, T. Alston. (L. F.)  
 Bissinger, Philip.  
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 Bjerring, Nicolas.  
 Black, William.  
 Blake, Charles F.  
 Bleeker, Anthony J.  
 Blodgett, William Tilden.  
 Blood, Henry.  
 Blood, O. Howard.  
 Bloomfield, William.  
 Blumenstiel, Alexander.  
 Blunt, Charles E.  
 Boardman, Andrew.  
 Body, John E.  
 Boese, Charles.  
 Bookstaver, Henry A.  
 Bonn, William B.  
 Bonner, Robert.  
 Boorman, J. M.  
 Booth, William A.  
 Booth, Robert, R.  
 Booth, William T.  
 Botta, Vincenzo.  
 Bouck, C. W.  
 Bowers, Arthur F.  
 Bradford, James F.  
 Bradford, William.  
 Brady, John R.  
 Brevoort, J. Carson.  
 Brewerton, Henry.  
 Brooks, Sidney.  
 Brown, Charles S.  
 Brown, James. (L. F.)  
 Brown, James M.  
 Brown, Stewart.  
 Brown, Walston H.  
 Brownson, W. H.  
 Brown, Vernon H.  
 Brownell, Silas B.  
 Bryant, William Cullen.  
 Bryce, James. (L. F.)  
 Bryce, T. Tileston.  
 Buckley, James M.  
 Bull, Charles S.  
 Burgess, William J.  
 Burnham, Arthur H.  
 Burton, Charles W.  
 Butler, Benjamin F.  
 Butler, Charles.  
 Butler, Cyrus.  
 Butler, William A.  
 Butterfield, Daniel.  
 Cable, George W.  
 Cabot, Stephen.  
 Caleb, Madison M.  
 Cameron, R. W.  
 Cammann, Hermann, H.  
 Cammann, Henry J.  
 Campbell, Allan.  
 Campbell, Howard.  
 Carhart, Thomas F.  
 Carson, James P.  
 Carr, David.  
 Carter, James C.  
 Carter, Oliver S.  
 Carter, Robert.  
 Carter, Walter S.  
 Cary, William F. (L. F.)  
 Case, Robert L.  
 Casey, Joseph J.  
 Casey, Thomas Lincoln.  
 Caswell, William H.  
 Catlin, Julius F.  
 Catlin, N. W. Stuyvesant.  
 (L. F.)  
 Caylus, Ernest.  
 Ceballos, J. M.  
 Chandler, C. F.  
 Chapman, Joseph H.  
 Chase, Leslie.  
 Chatellier, Joseph F.  
 Chatfield, Cyrus H.  
 Chatillon, John P.  
 Chauncey, Frederick.  
 Chauncey, Henry.  
 Chickering, Charles F.  
 Chickering, George H.  
 Chittenden, S. B.  
 Choate, William G.  
 Christern, F. W.  
 Church, George E.  
 Churchill, Franklin H.  
 Cisco, John J.  
 Clark, E. V.  
 Clark, Lot Curran.  
 Clark, Luther C.  
 Clendenin, J. W.  
 Clerke, Wm. B.  
 Coates, Isaac T.  
 Cochran, Henry Olay.  
 Cockcroft, Jacob H. V.  
 Coffin, C. C.  
 Cogswell, William L.  
 Cohn, Leopold.  
 Colgate, Bowles.  
 Colgate, Charles C.  
 Colgate, James B.  
 Colgate, Robert.  
 Colton, Joseph H. (L. F.)  
 Comstock, Cornelius.  
 Conger, Abraham B.  
 Conger, Clarence R.  
 Conklin, Eugene E.  
 Conklin, William A.  
 Conkling, Frederick A.  
 (L. F.)  
 Connery, T. B.  
 Conover, John T.  
 Constable, James M.  
 Constantine, Andrew J.  
 Constantine, John.  
 Conyngham, William L.  
 Cooley, James E. (L. F.)  
 Cooper, Edward.  
 Cooper, Peter.  
 Cooper, Stephen V. R.  
 Cooper, George C.  
 Corliss, A. W.  
 Corning, Erastus.  
 Cornwall, N. Ellsworth.  
 Corse, Israel.  
 Cossitt, Frederick H.  
 Coster, Charles H.  
 Cottenet, Francis.  
 Coughtry, W. B.  
 Courtright, Milton.  
 Coutan, Charles E.  
 Cowdin, Elliot C.  
 Cowdrey, N. A.  
 Cowles, Walter S.

Cox, Samuel S.  
 Cox, James Farley.  
 Crain, Durham Jones.  
 Crawford, S. W.  
 Crerar, John.  
 Crocker, William Baylies.  
 Crocker, George A.  
 Crocker, David.  
 Crooks, Ramsay.  
 Crosby, J. Schuyler.  
 Crosby, Hiram B.  
 Cruickshank, James.  
 Cruickshank, Edwin A.  
 Cushing, Caleb.  
 Cushman, W. F.  
 Cullum, George W. (L. F.)  
 Curphey, James.  
 Curren, Robert.  
 Curtis, William E.

Daly, Charles P.  
 Daly, Augustin.  
 Daly, Joseph F.  
 Dalrymple, Alexander.  
 Dana, Charles A.  
 Dana, William B.  
 Dancker, Charles.  
 Dane, Francis.  
 Dane, H. C.  
 Daniel, Edwin M.  
 Darling, William A.  
 Darow, William.  
 Dash, John B.  
 Davenport, J. Alfred.  
 Davidson, Stratford B.  
 Davies, Julian T.  
 Davies, Henry E., Jr.  
 Davies, Henry E.  
 Davison, E. Mora.  
 Davison, Charles A.  
 Davis, Alexander J.  
 Davis, Noah.  
 Davis, John H.  
 Davis, John G.  
 Davis, Samuel D.  
 Dayton, Jesse C.  
 De Castro, Diego.  
 Defendorf, Wilson.  
 Decker, Charles A.  
 Decker, John J.  
 Delafield, M. L.  
 Delafield, A. Floyd.

Delamater, Cornelius A.  
 Delmonico, L.  
 Del Monte, Leonardo.  
 De Lancey, Edward F.  
 Delano, Franklin H.  
 Deming, W. H.  
 Dennis, Charles. (L. F.)  
 Denny, Thomas, Jr.  
 DePeyster, Fred'k. (L. F.)  
 DePeyster, James F.  
 DePeyster, J. Watts. (L. F.)  
 Detmold, Christian E.  
 Detmold, William.  
 Devlin, Jeremiah.  
 Dewey, William C.  
 Dewing, Charles H.  
 De Witt, John E.  
 Deyo, R. E.  
 Dickerson, E. N.  
 Diefendorf, Menzo.  
 Diggs, D. William.  
 Dillon, Romaine. (L. F.)  
 Dinsmore, William B.  
 Ditson, Oliver.  
 Dix, John A.  
 Dixon, William P.  
 Dodd, Josiah F.  
 Dodge, William E.  
 Dodge, William E., Jr.  
 Donohue, Charles.  
 Donnell, Robert W.  
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 Douglass, Andrew E.  
 Dowd, William.  
 Dowley, John.  
 Downer, Samuel.  
 Draper, Frank E.  
 Driggs, Marshall S.  
 Drone, Eaton S.  
 Drowne, Henry T.  
 Dryfoos, Louis.  
 Duane, Martin H.  
 Du Bois, William A.  
 Du Bois, Eugene.  
 Du Chaillu, Paul B.  
 Dudley, J. G.  
 Dufais, Ferdinand F.  
 Duke, John H.  
 Dun, R. G.  
 Duncan, William Butler.  
 Dunscomb, Richard T.  
 Dusenberry, E.

Dunshee, Henry W.  
 Dupee, James A.  
 Durant, Thomas C.  
 Dutilh, E.  
 Dwight, James F.  
 Dwight, Timothy T.  
 Dwight, Theodore W.  
 Duyckinck, Evert A.  
 Eaton, Dorman B.  
 Eaton, John.  
 Eaton, D. Cady.  
 Eaton, Sherburne B.  
 Edey, Charles C.  
 Edwards, Jonathan.  
 Egbert, Milton C.  
 Egleston, Henry P.  
 Eidlitz, Marc.  
 Ellinger, Moritz.  
 Elliott, Andrew Foster.  
 Elwell, Charles F.  
 Ely, D. J.  
 Emmet, Thomas Addis.  
 Emot, James.  
 Endicott, Francis.  
 Entwisle, Edward.  
 Ernst, C. W.  
 Evarts, William M.  
 Evans, Walton W.  
 Ewen, John, Jr.  
 Eyre, Henry S. P.  
 Fabbri, Egisto P.  
 Fabbri, Ernesto G.  
 Fabian, Robert L.  
 Faile, Charles V.  
 Faile, Thomas H.  
 Fairfield, Walter S.  
 Fairchild, Egbert H.  
 Fairbanks, Franklin.  
 Fanshawe, Henry A.  
 Farragut, Loyall.  
 Fargo, William.  
 Fargo, James C.  
 Farrell, Thomas M.  
 Farquhar, Francis U.  
 Fatman, Lewis.  
 Fawcett, Frederick.  
 Fay, Richard S.  
 Fellows, John P.  
 Fenton, S., Jr.  
 Fenton, D. W.

- Fernbach, Henry.  
 Ferry, George J.  
 Feust, Sigismund.  
 Field, Dudley.  
 Field, H. M.  
 Field, Cyrus W. (L. F.)  
 Fish, Hamilton.  
 Field, David Dudley.  
 Field, Charles M.  
 Field, B. H. (L. F.)  
 Fisk, Harvey.  
 Fiske, Arthur D.  
 Fithian, Freeman J.  
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 Fliess, William M.  
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 Foerster, William.  
 Fogg, William H. (L. F.)  
 Forman, Alexander.  
 Foster, John A.  
 Foster, William R.  
 Forster, Robert.  
 Forsyth, John.  
 Foshay, James W.  
 Foster, J. P. G.  
 Foulke, Joseph.  
 Foulke, Thomas.  
 Fougera, Edmund C.  
 Fowler, Edward P.  
 Fox, Austen G.  
 Fox, Baldwin N.  
 Frame, Charles P.  
 Francis, John M.  
 Francis, Lewis.  
 Francklyn, C. G.  
 Fraser, James.  
 Fraser, Edward A.  
 Freedman, John J.  
 French, Isaac V.  
 Friedman, Arnold.  
 Froebel, Charles.  
 Frohwein, Theobald.  
 Frothingham, O. B.  
 Fry, James B.  
 Fuller, Charles D.  
 Furnald, Francis P., Jr.  
 Funch, Christian F.  
 Furniss, William.  
  
 Gabb, William M.  
 Galpen, Horace.  
 Gambrill, C. D.  
  
 Gamewell, John N.  
 Gardner, Hugh.  
 Garland, John R.  
 Gebhard, William H. (L. F.)  
 Gedney, Frederick G.  
 Geissenhainer, Frederick W., Jr.,  
 Gerard, James W., Jr.  
 Germond, Wellington.  
 Gerry, Elbridge T. (L. F.)  
 Gescheidt, Louis A.  
 Gibbs, Theodore K.  
 Gibert, Fred E.  
 Gilbert, Clinton.  
 Gilman, William C.  
 Gilman, Charles F.  
 Gillmore, Q. A.  
 Gillett, Daniel W.  
 Gilsey, Peter.  
 Gitterman, Henry.  
 Glaubensklee, Theodore G.  
 Gleason, F. L.  
 Gleason, Wesley.  
 Goadby, William H.  
 Godon, Sylvanus W.  
 Godkin, E. L.  
 Goldsmith, Jacob.  
 Gomez, Raphael M.  
 Goodsell, James H.  
 Gordon, Robert.  
 Gordon, James.  
 Gorton, Edwin G.  
 Gottsberger, William S.  
 Gould, Linus A.  
 Goulding, B. L.  
 Gouge, Henry A.  
 Graham, R. M. C.  
 Graham, C. K.  
 Graham, James L. (L. F.)  
 Grain, Francis H.  
 Gray, Frank A.  
 Gray, William H.  
 Gray, Horace.  
 Green, Andrew H.  
 Greene, G. S.  
 Greenwood, Isaac J.  
 Greene, John W. (L. F.)  
 Greenebaum, David S.  
 Green, John.  
 Greenleaf, Augustus W.  
 Greene, F. V.  
 Gregory, James F.  
  
 Grinnell, Moses H.  
 Grinnell, Robert M.  
 Griswold, James C.  
 Griswold, George. (L. F.)  
 Groom, Wallace P.  
 Grosvenor, James B.  
 Guernsey, Egbert.  
 Gurley, Henry.  
 Gunther, Charles G.  
 Gunther, William H.  
 Gunther, F. F.  
 Guth, John.  
  
 Hadden, John A. (L. F.)  
 Haight, Charles C.  
 Haight, Edward, Jr.  
 Haight, Charles.  
 Haines, John P.  
 Haldeman, S. S.  
 Hallgarten, Adolphus.  
 Hallgarten, Charles L.  
 Hall, A. Oakey.  
 Hall, Elial F.  
 Hall, Randall C.  
 Hallock, Mrs. Francis.  
 Halsted, William M.  
 Hamersley, Louis C. (L. F.)  
 Hamersley, A. Gordon.  
 (L. F.)  
 Hamersley, John W.  
 (L. F.)  
 Hamilton, Alexander, Jr.  
 Hammond, William A.  
 Hammond, Henry B.  
 Hampton, Elwood.  
 Hancock, Winfield S.  
 Hand, Clifford A.  
 Hand, Robert N.  
 Handbury, Thomas H.  
 Harbison, Edward.  
 Harbeck, John N.  
 Harper, Nathan.  
 Harris, Townsend. (L. F.)  
 Harrison, Thomas F.  
 Hartt, Charles F.  
 Hascall, William S.  
 Hastings, George S.  
 Hatch, Roswell D.  
 Hatch, Rufus.  
 Hatch, Daniel B.  
 Havemeyer, James.  
 Havemeyer, Hector C.

Havemeyer, John C. (L. F.)  
 Havemeyer, Theodore A.  
 Havens, Charles G.  
 Hawes, James W.  
 Hawkes, W. Wright.  
 Hawk, Samuel.  
 Hawkins, Dexter A.  
 Hawley, E. Judson.  
 Haydock, George G.  
 Hayes, Isaac I.  
 Hay, Allen.  
 Hay, John.  
 Hazard, Rowland R.  
 Heap, D. P.  
 Hegeman, William.  
 Hegeman, William A. O.  
 Helmuth, William T.  
 Henderson, John C.  
 Hendricks, M. M.  
 Hendricks, Joshua.  
 Hendricks, Edmund.  
 Hensel, M.  
 Herring, Silas C.  
 Herring, Frank O.  
 Hess, Julius.  
 Heuer, William H.  
 Hewitt, Abram S.  
 Hill, John L.  
 Hinrichs, Oscar.  
 Hitchcock, Roswell D.  
 Hitch, Henry F.  
 Hoadley, John C.  
 Hoe, Richard M.  
 Hoffman, William B.  
 Hodges, M. F.  
 Hoguet, Henry L.  
 Hoguet, Robert J.  
 Holbrook, M. L.  
 Holbrook, E. W.  
 Holbrook, E. F.  
 Holbrook, Levi.  
 Holcombe, William F.  
 Holton, David P. (L. F.)  
 Hoppin, W. W., Jr.  
 Hoppin, William J.  
 Houghton, Edward C.  
 Houghwout, Frank F.  
 Houston, D. C.  
 Howard, Thomas T., Jr.  
 Howard, John R.  
 Howell, Charles W.  
 Hoxie, Richard L.  
 Hoyt, J. Q.

Hoyt, David.  
 Hoyt, Oliver.  
 Hoyt, Harlow M.  
 Hubbard, O. P.  
 Hughes, John.  
 Hughes, William H. T.  
 Hurlbert, William H.  
 Hull, C. W.  
 Hunt, Wilson G.  
 Hutchins, Waldo.  
 Hunter, Edward.  
 Hutton, Lawrence.  
 Huntington, C. P.  
 Hunter, Charles F.  
 Hunter, John W.  
 Hunter, James.  
 Huntington, Daniel.  
 Hurlburt, Henry A. (L. F.)  
 Hyde, Samuel T.

Ingraham, Daniel P.  
 Ireland, John B.  
 Isaacs, Isaac S.  
 Iselin, William E.  
 Iselin, Adrian, Jr.  
 Ives, Frederick E.

Jacob, Ephraim A.  
 Jackson, H. A.  
 Jackson, James F.  
 Jackson, Frederick W.  
 Jaffray, Edward S.  
 Jaffray, Robert.  
 James, Frederick P.  
 James, D. Willis.  
 Jameson, Joseph A.  
 Janssen, Gerhard.  
 Jarvis, Nathaniel, Jr.  
 Jarvis, Robert M.  
 Jay, John. (L. F.)  
 Jenkins, William L.  
 Jesup, M. K.  
 Johnson, Henry W.  
 Johnson, Henry J.  
 Johnson, Hezron A.  
 Johnson, Bradish.  
 Johnson, William M.  
 Johnston, John T.  
 Johnston, James B.  
 Johnston, Melville M.  
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 Jones, Walter R. T.  
 Jones, Edward A.

Jones, John Q.  
 Jones, George.  
 Jones, Edward Renshaw.  
 Jones, William A.  
 Jordan, Conrad N.  
 Jordan, Edward.  
 Jova, John J.  
 Joy, Charles A.  
 Judah, Samuel B. F.  
 Judson, William D.

Kalbfeisch, Charles H.  
 Kane, J. Grenville.  
 Kane, Aloysius J.  
 Kasmire, George E.  
 Kauffman, Samuel.  
 Kaufmann, Sigismund.  
 Kayser, Julius.  
 Kearny, Joseph R.  
 Keck, Thomas.  
 Keese, Samuel T.  
 Kelly, Eugene.  
 Kemble, Gouverneur N.  
 Kemp, John H.  
 Kemp, William.  
 Kendrick, H. L.  
 Kennan, George.  
 Kennedy, Robert L.  
 Kennedy, Harvey.  
 Kent, Elmore A.  
 Ketcham, Enoch.  
 Ketchum, Franklin M.  
 Keteltas, Eugene.  
 Kidder, Henry P.  
 Kiernan, Lawrence D.  
 King, Oliver K.  
 King, George.  
 King, Lewis.  
 King, David.  
 King, Edward.  
 Kingsland, A. C.  
 Kingsland, William M.  
 Kirkland, Charles P.  
 Kip, Lawrence.  
 Kitchen, William K.  
 Kitching, Robert N.  
 Kitchen, James.  
 Kircheis, Alexander F.  
 Klamroth, Albert.  
 Koch, Joseph.  
 Knapp, Herman.  
 Knapp, Gideon L.  
 Knoedler, Julius.

- Knower, John.  
 Krackowizer, E.  
 Kunhardt, Henry R.  
 Lade, William.  
 Lancey, Robert C.  
 Landon, Charles G.  
 Lane, Smith E. (L. F.)  
 Lane, George W.  
 Langdon, Walter. (L. F.)  
 Langdon, Woodbury.  
 Lanier, J. F. D.  
 Lanier, Charles.  
 Lambert, E. W.  
 Lamson, Charles.  
 Lamson, Leonidas M.  
 Langer, Morris.  
 Lapsley, Samuel W.  
 Larremore, Richard L.  
 Lathers, Richard. (L. F.)  
 Lathrop, F. L. (L. F.)  
 Latting, John J.  
 Lauterbach, Edward.  
 Lawrence, John S. (L. F.)  
 Lawrence, Abraham R.  
 Lawrence, Joseph B.  
 Lawrence, Effingham H.  
 Lawrence, Alexander C.  
 Lawrence, Samuel B.  
 Lawrence, George N.  
 Lawton, Walter E.  
 Leaman, Walter K.  
 Leary, Arthur.  
 Leavenworth, E. W.  
 Le Comte, Joseph.  
 Lederle, Joseph.  
 Lee, Ambrose.  
 Leggett, Francis W.  
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 (L. F.)  
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 Marshall, William L.  
 Marshall, F. Pelham.  
 Marshall, Charles H.  
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 May, Lewis.  
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 McAlpin, David H.  
 McClure, George.  
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 McCurdy, R. H.  
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 McElligott, Henry R.  
 McFarland, Walter.  
 McLean, James M.  
 McMahan, M. T.  
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 Menken, J. Stanwood.  
 Menzies, William.  
 Merrill, William J.  
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 Merrill, William W.  
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- Moore, George H. (L. F.)  
 Moore, Frank. (L. F.)  
 Moore, W. H. H. (L. F.)  
 Moore, C. B.  
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 Morgan, Charles L.  
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 Murphy, Henry C.  
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 Oothout, Edward.  
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 Palmer, Ebenezer.  
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 Parish, Henry.  
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 Southworth, Alvan S.





Wetmore, William B. (L. F.)	Wide, Samuel, Jr.	Woodruff, Israel C.
Wetmore, George C.	Wiley, Franklin.	Worcester, S. F.
Weyman, Charles S.	Wilkeson, Samuel.	Work, J. Henry.
Wheeler, DeWitt C.	Wilson, John M.	Wolfe, Christopher.
Wheeler, John V.	Wilson, J. H.	Worthen, William E.
Wheeler, Everett P.	Wilson, James G. (L. F.)	Worth, James L.
Wheelwright, B. F.	Willard, Seymour.	Wooster, George H.
White, George E.	Willard, J. H.	Wreaks, Charles F.
White, H. C.	Willets, Samuel.	Wright, E. Kellogg.
White, John H.	Wilder, Marshall P.	Wright, William W.
White, Alexander M.	Wilkes, George.	Wyckoff, Jacob F.
White, Charles T.	Willis, Benjamin A.	Wylie, W. Gill.
Whittier, John G.	Williams, John S.	Yeaman, George H.
Whitewright, W., Jr.	Williams, Stephen C. (L.F.)	Young, Mason.
Whitney, A. B.	Williamson, David B.	Youngs, Henry I.
Wickham, William H.	Winston, Frederick, S.	
Wiener, Joseph. (L. F.)	Witthaus, R. A. (L. F.)	
Wilcox, Orlando B.	Witthaus, G. H. (L. F.)	Zachos, J. C.
Wilcox, Franklin A.	Wood, Fernando.	Zborowski, Martin.

## ANNUAL REPORT OF THE COUNCIL FOR 1875.

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ROOMS OF THE AMERICAN GEOGRAPHICAL SOCIETY, }  
 NEW YORK, *January 9th*, 1876. }

The Council begs leave to submit the following, as their report of the operations of the Society during the preceding year :

Since the date of the last annual report eight (8) meetings of the Society have been held.

At the last annual meeting, which took place on the evening of January the 19th, 1875, at the hall of the New York Historical Society, the present board of officers was elected. The Hon. Robert B. Roosevelt, commissioner of fisheries of the State of New York, addressed the Society on "The Geographical Distribution of Fish in the United States," followed by Mr. A. L. Rawson upon "The Exploration of Palestine from a Practical Standpoint."

On February the 25th, Chief Justice Daly, the president, delivered the annual address, subject : "The Geographical Work of the World in 1875."

March the 30th, Mr. Alvan S. Southworth, the recording secretary, read a paper on "The New State of Colorado," followed by Mr. Ernest Ingersoll on "The Remains of the Ancient Civilization in the Cañons of the San Juan."

April the 29th, General Egbert L. Viele addressed the Society on "The Physical Geography, Mountain and River Systems and Topographical Features of the State of New York."

May the 25th, Professor Felix Adler lectured on "The Influence of the Physical Geography of Palestine on Hebrew Thought."

November the 11th, Dr. Gerhard Rohlfs (gold medalist of the Royal Geographical Society) addressed the Society on his "Exploration of the Oases of the Desert of Sahara."

And December the 13th a meeting of the Society was held to discuss Mr. Henry M. Stanley's "Explorations in Equatorial Africa." Among those who took part in the discussion were Chief Justice Daly, Mr. Bayard Taylor and Dr. George B. Wallis.

The annual report of the treasurer, Mr. George Cabot Ward, shows a satisfactory condition of the finances of the Society and, as trea-

suror, exhibits a cash balance in his hands at the end of the year to the credit of the Society of \$1,430<sup>88</sup>/<sub>100</sub>, and as trustee \$2,084.22, making a total of \$3,515.11.

Three hundred and forty-four (344) new fellows have been elected during the year and have duly qualified.

The correspondence of the Society with travelers, explorers and critics of geography over the world has been fully maintained so as to supply much needful and original information from the principal, most authentic and most interesting sources.

It is believed that the publications of the Society (three bulletins) have been received with favor.

The collection of rare and valuable maps, early geographical works and the books of travel and periodicals of the day have been often consulted by students and authors with a profit which they have gladly acknowledged. The proceedings of the Society find welcome room in the leading geographical magazines of England and the continent of Europe.

The annual due has been raised by a vote of the Society from five dollars (\$5) to ten dollars (\$10). It was induced to this measure by the fact that a subscription of some twenty-five thousand dollars (\$25,000) has been made to purchase a house for its exclusive use and occupation. It is expected that such house will soon be selected and bought and the library and collections of the Society established in it, thus providing our fellows and scientific friends an agreeable place of meeting whether for study, research or conversation. The best features of a literary and scientific club can thus be afforded without any of those interruptions by many deemed objectionable.

By order of the Council.

WILLIAM REMSEN,

*Chairman.*



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## PAPERS READ BEFORE THE SOCIETY.

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**N. B. - THE AUTHORS ARE ALONE RESPONSIBLE FOR THE CONTENTS OF THEIR  
RESPECTIVE PAPERS.**

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# ANNUAL ADDRESS.

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By CHIEF-JUSTICE DALY, the President of the Society.

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## THE GEOGRAPHICAL WORK OF THE WORLD FOR 1875.

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The year 1875 completed the third quarter of the nineteenth century, a period distinguished by the activity which has prevailed in every branch of scientific inquiry, but particularly distinguished as a remarkable period of geographical exploration and discovery.

The history of geographical knowledge is a history of its rapid acquisition in periods very limited in point of time, but of great activity, and of long intervals of repose, in which comparatively little was done, or a great deal lost that had been previously acquired. For the last twenty-five years we have been living in one of those periods of exceptional activity, for at no time has an interest so widespread been manifested for geographical exploration since that great age of maritime discovery that began in the early part of the fifteenth century with the exploration of the western coast of Africa by the Portuguese, and culminated in the circumnavigation of the globe by Magellan. The comparatively small limits of about a century is all that is embraced from the time (1418) when Prince Henry of Portugal, surnamed the Navigator, took up his abode upon the promontory of Sagres to devote the residue of his life to the fitting out of expeditions for the exploration of the coast of Africa beyond Cape Bojador, a region then wholly unknown, and the year 1519, when Magellan entered the Pacific by the discovery of the straits that bear his name. Within that period the captains of Prince Henry had sailed around the continent of Africa; Columbus had discovered America; his companion, Nunez De Balboa, the Pacific; Sebastian Cabot had followed the coast of North America to the sixty-seventh parallel of north latitude; and Magellan's vessel, the *Vittoria*, after sailing around the world, had returned in 1522 to San

Lucar, in Spain, the port from whence she set out. The century that followed this period of discovery was occupied with the more particular exploration and settlement of the regions thus brought to the knowledge of mankind, and with the labors of geographers and cartographers in arranging the great mass of new materials into a reconstructed system of geography. With the exception of fruitless efforts to discover, in the interest of commerce, a north-east or a north-west passage to the Indies around the northern part of the globe, or directly across the pole, the zeal for geographical discovery abated through the seventeenth and eighteenth centuries; the world being sufficiently occupied with what it had already acquired, either in building up great empires in the newly-discovered continents of North and South America or by extending the rule of maritime nations over the coast of Africa, and the remoter parts of Asia, as in the settlement of the colonies established by the Portuguese and by the British conquest of India. In fact, so large a portion of the earth's surface had become known within so short a period, that it presented enough to absorb all the activity of civilized nations for three centuries in the work of colonization, settlement or conquest. It was not until near the middle of the nineteenth century, when this great work had produced its results in the establishment of such nations as the United States, Mexico, the Republics of Central America, Brazil, the other States of South America, and of a vast dominion under British rule in India, and by the extension of Russia over a large part of Northern Asia, that the attention of mankind was again drawn to the yet undiscovered or imperfectly known portions of the earth, and a new interest awakened in geographical exploration and discovery. This may be said to have begun with the founding of a geographical society in Paris in 1821, of another in Berlin, in 1828, and the establishment of the Royal Geographical Society of London in 1830. These societies were formed to cultivate the science of geography in a more comprehensive spirit, to facilitate the acquisition of geographical information by the establishment of libraries, to disseminate it by publications, and to encourage and assist scientific travelers and explorers. Like all new things, however, it was some years before these societies produced any effect, or the world recognized the value of the purpose for which they were established; whereas the results which have since been brought about, chiefly through the instrumentality of such institutions, are beyond any thing which the most sanguine of their pro-



jectors could have anticipated. The Royal Geographical Society of London may be taken as an illustration of these societies. It has now 3,035 fellows, each paying two pounds a year' a large permanent capital, and an annual income of \$35,000. It has a building of its own, a fine library and map room, and is able to, and has frequently sent out expeditions for geographical exploration and discovery, sometimes in co-operation with the government, and sometimes without it. Before, however, it reached this state it had, as I have been informed, to struggle for some years, as we have had, to keep up its organization. The turning point of its history, and in its influence, appears to have been the election, in 1843, of Sir Roderick I. Murchison to the presidency, then in the fullness of his fame as a geologist, but who thenceforth entered upon a new field, and one by which he was afterwards chiefly known. In his first annual address, an elaborate and exhaustive production, he surveyed the then state of geographical research throughout the world, and pointed out with remarkable sagacity that the parts of the globe to which exploration and research should be directed and concentrated were Central Africa, Australia, and the regions surrounding the North and South poles. Although his own fame had been made as a geologist, his course then and during the many years that he was the guiding spirit of the Royal Geographical Society, showed very plainly his conviction that a thorough knowledge of the surface of our own planet, and of those physical laws that affect everything upon it, is practically of more importance to us than a knowledge of its past physical history or of other bodies in space.

It was not that he undervalued the sciences of geology and astronomy, which, in fact, form a part of the science of geography; but the earth is our own planet, the details of which are within our grasp, and there is therefore the greater reason why every effort should be directed to acquire a thorough knowledge of it, particularly as the increase of that knowledge requires widely extended efforts over different parts of it, and a vast accumulation of details. I am not now expressing any thing he may have said, but rather deducing my own conclusions of what he thought from what he did. He was evidently impressed with the conviction that sufficient attention was not then given to the advancement of the science of geography, and to his eminently practical mind it was clear that it was not to be advanced by simply studying it in the closet, but by explorations and scientific researches, requiring persistent efforts, continuous expendi-

tures, and the labors of a numerous, zealous and intelligent class of workers over a large part of the earth's surface. To accomplish this, the whole age had to be influenced, governments enlisted, and the different societies brought into active co-operation with each other, and it was to this work that Sir Roderick then set himself, and to which he may be said to have chiefly devoted the remainder of his life.

I have selected Sir Roderick Murchison rather as a type, for it was not to him alone, but to many other eminent men in France, Germany, Russia, Italy and other countries, preëminent among whom was Alexander Von Humboldt, that the conviction became general that the unknown, or imperfectly known, parts of the earth should be thoroughly investigated, and scientific researches actively prosecuted in respect to all phenomena coming under the general head of physical geography. This has, in fact, brought about as I have said, a geographical age. There are now scattered over the globe thirty-four geographical societies, and if we add other organizations devoted in part to geographical inquiry or labors, the number would be augmented to about fifty. Many of them are well endowed, large in membership, and strengthened not only by the co-operation, but by annual grants of money from the governments of the countries in which they are situated.

How thoroughly this spirit was aroused, will appear by a brief but necessarily imperfect statement of what has been accomplished since this movement began.

When it commenced the map of Africa was, with the exception of the north-western projection above the Gulf of Guinea, and the Nile region, almost a blank from the Mediterranean to the country in the vicinity of the Cape of Good Hope. Of the 17,000,000 of square miles in Asia, about 12,000,000 were either entirely unknown or wholly cut off from all intercourse with mankind. The condition of Australia, with an area of 3,000,000 of square miles, is best expressed by quoting the language of a geographer of that day: "A corner of this huge mass of land," he says, "is all that is known." Twenty-five years ago the European population of Australia was estimated at about 50,000; it is now over a million and a half, or thirty times as great.

The second island in point of size, and one of the most fruitful in the world — Papua, or New Guinea — is referred to by the same geographer (Murray) as almost a *terra incognita*, having generally,

he then said, "been viewed only by navigators from a distance." And in respect to the next great island—Borneo—he puts the population of the colonies there under the Dutch at about 9,000. In 1870 the population of the Dutch colonies in Borneo was 189,253. The settled portion of the United States then embraced 800,000 square miles, beyond which was an area of 2,500,000 square miles, inhabited by savages, and almost unknown, for we knew little of it then beyond what was known in the time of Jefferson, with the exception of Major Long's journey and Prof. Nicollet's exploration of the head-waters of the Mississippi.

This was the state of things at the beginning of the period referred to. I will now enumerate what has been done since, and especially within the last twenty-five years:

In Asia: The opening of the whole of China and Japan, the acquisition by the Russians of nearly the whole of Turkestan, and the inauguration of a policy on their part which, either by treaty or military conquest; will throw open the whole of Northern Asia to the free intercourse of the world. The extensive explorations by them in Northern Siberia, and of the rivers that flow into the Arctic. The many journeys, explorations—geographical and archæological—made through Southern Arabia, Persia, Affghanistan, Beloochistan, and the northern regions of India, and explorations of the like character in Burmah, Siam and Cambodia. The settlement of the French in Cochin-China, and journeys to a partial extent in Corea, and to a greater extent in Manchooria. The Euphrates expedition. The continuation of the great survey of India. The survey of Palestine and the cutting of the Suez Canal.

In Africa: The discovery of the great lakes, as well those which are the reservoirs of the Nile as those lying south of the equator. The exploration of the country south of Abyssinia, between these lakes and the Eastern Coast, and the discovery of the great range of mountains in that region, with their snow-capped peaks, the highest elevated land in Africa. The military occupation of Abyssinia and of Ashantee by the English; the extensive journeys and researches in Northern and North-eastern Africa, by Barth, Overweg, Richardson, Rholfs, Schweinfurth, Miani, Nachtigal and others. The various expeditions and individual journeys along the Western Coast, and the explorations of its immediate interior by Du Chaillu, Burton, Baines, Blyden, Gandy, Güssfeldt, etc., etc. The two journeys across Central Africa, from east to west and west to east, by Dr. Living-

stone; his journey from the cape upward; his exploration of the Zambezi, and of the countries by which it is watered; his discovery of the great net-work of rivers and lakes in Central Africa, below the equator, which he was pursuing at the time of his death, and the following up of that exploration by Lieutenant Cameron, with the latter's journey through Central Africa, from east to west. The numerous explorations in South and South-eastern Africa, from the Orange river to the Limpopo, and from that point along the Eastern Coast and its interior, as far as the parallel of Zanzibar, which, with the exploration of the imperfectly known parts of the Island of Madagascar by Grandidier and Mullins, is but a very general statement of what has been done in Africa. What exploration has accomplished in Africa may be judged by a single fact. In 1850 the area of cultivated land in Egypt was 2,000,000 of acres, in 1874 it was 5,000,000.

I may next refer to the numerous explorations around and across the great continent of Australia, from Sturt's early journey to the last ones of Warburton and Forster. The survey of large portions of the coast of Papua, or New Guinea, and explorations in the interior by Beccaria, D'Albertis, Meyer, Van Rosenberg and MacLeay. The explorations in Formosa by Steere, Le Gendre and others, and the settlement of colonies and the establishment of governments by the English in New Zealand and the Fiji Islands. The explorations of the Arctic to within sight of the 83° parallel of north latitude, including the discovery of the long-sought North-Western passage, and of its inutility. The exploration of the Antarctic circle as far as the 73° of south latitude, and the remarkable discovery that the ice-bound regions, both of the Arctic and Antarctic, was at a former period of the world's history covered with a luxuriant vegetation, and that plants and animals then existed there in great abundance, which are found now only in the tropics, or in the more southern parts of the temperate zone.

And finally our own explorations of the great western region, between the Mississippi and the Pacific, by Fremont, Emory, Simpson, Marcy, Stansbury, Sitgreaves, Gunnison, Beckwith, Whipple, Williamson, Parke, Warren, Ives, Reynolds, Macomb, Mullen, Wheeler and other gallant, efficient and distinguished military officers conducting reconnoissances or expeditions across its plains, deserts and mountains, accompanied in these expeditions by scientific civilians, to whose labors we are indebted for our knowledge of its

geology, agricultural resources and natural history. Among strictly scientific works by civilians I should also enumerate Whitney's Survey of California, followed by King and Gardner's belt of geological and topographical survey across the North American Cordilleras, Hayden and Gardner's survey in the Rocky Mountains, and Powell and Thompson's of the great cañons of the Colorado, through whose united labors so much of the geography of this vast region has become known; its great mountain ranges, extraordinary cañons, wonderful geysers, deeply interesting ruins of a pre-historic and semi-civilized people of whom we know but little; its lakes, rivers, majestic cataracts, broad areas of culturable land, already largely and to be still more extensively settled, and finally the millions it has yielded in gold and silver; a region so vast beyond the one hundredth meridian that it will be twenty years before we obtain proper maps of it, unless the government is more liberal in providing for its exploration and survey than it has hitherto been.

To these geographical labors and explorations within this period in various parts of the globe must also be added extensive researches of a geographical character, such as deep sea-dredgings for the investigation of the temperature of the ocean, the movements of submerged currents, the plant and animal life existing at great depths and the configuration of the bottom of the seas, the observation and study of oceanic currents and their cause, the distribution of heat north and south of the equator by the instrumentality of these currents, and its effects upon climate, as well as the effect of the currents from polar regions in modifying the heat of the equator. The meteorological observations in respect to the course of the winds; and the investigations of the laws and of the cause of hurricanes, cyclones and other aerial disturbances. The magnetic observations in elucidation of the difficult subject of terrestrial magnetism. The numerous measurements of great mountain heights in the more elevated regions of the globe. The extensive survey of coasts, prominent among which is our own great Coast Survey. The trigonometrical surveys carried on in many countries in Europe. The investigation of the cause of the glacial epoch, and possibly of inter-glacial epochs, or a succession of alternate warm and cold periods, each extending over long periods of time and their effect in bringing about the present condition of the earth's surface by changes in the level of the sea, and the submergence of the land.

This very inadequate statement will show how great, wide-spread

and constant has been the work of exploration and research within the period referred to and how truly it may be denominated a geographical age.

I shall now, in the discharge of my annual duty, proceed to give some account of the researches, discoveries and geographical work of the past year, beginning with an account of what has been done in our own country:

### UNITED STATES.

The geographical explorations and labors in this country during the year, have consisted chiefly of the continuation of those heretofore begun by the government, and of which I have previously given an account. They embrace the labors of the Coast Survey, of the United States Corps of Engineers, the Smithsonian Institution, and the explorations and surveys under the direction of the Navy Department and of the department of the Interior, to the more important of which I shall hereafter individually refer.

Mr. Wm. H. Dall, who, in connection with the Coast Survey, has been engaged in labors upon the N. W. Coast of America, has, after careful observations, determined the height of Mount St. Elias, the highest mountain in the United States, to be 19,500 feet, with the possible error of 500 feet, Mount Fairweather, 15,500, and Mount Crillon 15,900, and ascertained approximatively the heights of Mounts Cook, Vancouver and La Perouse; and he is of opinion that these mountains are not of volcanic origin, as has been heretofore supposed.

The Signal Office at Washington, under Gen. A. J. Myer, has continued its system of daily weather maps for each of the great divisions into which the several States have been grouped, giving the character of the weather that is likely to follow in the next twenty-four hours in each division, as well as the actual weather experienced during the preceding twenty-four; the result of which has been a continued assurance of the value of the observations and of the dependence that can be placed upon them; in which connection I may remark that Dr. Kopper, of St. Petersburg, predicted, from his observations, in 1874, that the winter of 1875 would be an exceptionally severe one, which has been confirmed by the present winter in Europe.

### THE WHEELER EXPEDITION.

The geographical expedition and surveys west of the one hundredth meridian, under Lieut. Wheeler, have been carried on during

the past year over certain areas in Southern and South-western Colorado and North-western New Mexico.

The report and accompanying papers this year are of exceeding interest, from their fullness, the care with which they have been prepared and the competency of the scientific gentleman connected with the survey.

These papers, which form the appendix to Lieut. Wheeler's report, embrace the geography, geology, the agricultural resources, the birds, quadrupeds, reptiles, the botany, the languages and characteristics of existing races, together with the remains, architectural and otherwise, of the pre-historic races that dwelt in Arizona, Colorado and New Mexico.

Lieut. Wheeler's impression of the general resources of South-western Colorado is extremely favorable. Better communication, he says, more settlers, and money for the development of its mines, is what is needed, for nature has supplied the earth with what the energetic industry of man can subjugate to his wants. And of this portion, and Northern Mexico, Dr. Loew, the mineralogist, says, that although a great portion of these regions would be of little use for agricultural purposes, from the limited rainfall, there are still quite a number of sections in which agricultural and pastoral pursuits can be carried on.

Dr. Rothrock gives the following general result of observations in the portions of Arizona and New Mexico traversed by him during the year: The soil possesses the elements requisite for vegetable growth, where water sufficient for irrigating purposes can be found, and nearly all portions accessible to water can be utilized for grazing. The forests contain timber enough for many years. Large areas, now abandoned for want of water, can be cultivated by a system of tanks, in which water can be stored when plentiful, and the waste of water in surface drainage and rapid evaporation can be lessened, so that the rainfall would be made to produce more lasting benefit; and finally, that the prevailing diseases are of less than the usual fatality, and will diminish as the country is brought under cultivation. He concludes with the observation that Utah, so large a portion of which is now covered with fertile farms, vineyards and orchards, was, a few years ago, as unpromising as either Arizona or New Mexico, and says that what are now waste places in Arizona and New Mexico, will, as the population of the Union increases, be redeemed and made tributary to civilization.

The reports of Professor Cope, the paleontologist; of Dr. Loew, the

mineralogist; of Dr. Yarrow, the zoölogist, and of Lient. Burney respecting their explorations of the ruined cities, burial places, dwellings, fortifications and other remains of the unknown people by whom this region, now occupied by savages (Apaches, Utes and Navajos), was once thickly populated is of great interest.

Prof. Cope found that what is called the eocene plateau of North-western New Mexico, where now there is no people, was once occupied by a numerous population, the evidence of which was found throughout the country in ruined buildings, pottery, flint implements and human bones. The conic hill-tops in many instances were crowned with stone structures, which, upon examination, proved to be ruined dwellings, within and about which fragments of pottery abounded. On one of the hills surrounded by a wall the remains of a town was found called Cristone. The wall at first appeared quite inaccessible, but by climbing round the eastern face of the precipice they discovered that it was ascended by a stair-case of stones, a number of which were still in position. Often the walls of these houses, though in some cases only the foundations remained, and on the almost inaccessible crest upon which this town was perched he could see similar ruins on an outlying hill.

In the Moquis villages of Arizona, described by Ives and Newberry, towns were perched on high eminences for the purpose of defense, but placed near some stream which enabled the inhabitants to carry on a system of agriculture; but what was discovered last year in these ruined towns is very remarkable. There were no indications that the inhabitants had water at these great elevations, and no evidences that cisterns had ever been employed. Pottery was found distributed on the denuded hills for many miles, with every indication that this now unpeopled region of the Gallinas was formerly as populous as are now the more densely settled eastern or middle States, the number of buildings to the square mile being equal to, if not greater, than the number now existing in the rural districts of New Jersey and Pennsylvania. The extraordinary fact in connection with these ruined towns and dwellings is the remoteness of the larger proportion of them from water, many being a distance of twenty-five miles from the nearest source of supply. This is the more curious as there are no traces of cisterns, but only earthen water pots, narrow necked globular vessels, of comparatively small size. The existing Indian tribes who visit this region, at intervals, know nothing of the people who formerly inhabited it. No traces of



metals were found. On adjacent rocks there were Indian inscriptions and carvings. Dr. Loew explored ruins of the same character in New Mexico. In Aztlan, some of the ruins found were fortified structures, having as many as 500 rooms. Over the surrounding plain, solitary round buildings were profusely scattered, and all of these ruins are fifteen miles distant from any water. But in respect to these particular ruins in Aztlan they were told by the Indian guide that there were cisterns upon the mesas in which the rain had been caught. Upon the narrow ridge of one of the mesas, between colossal walls of sandstone, close to the frightful precipices of the cañons, the ruins of a town were found, of eighty houses, partly in parallel rows partly in squares, and partly perched in gaps between the over-hanging rocks. Nearly every house had one story and two rooms; the roofs had fallen in, with many of the side walls, and broken pottery, charred corn and primitive instruments for grinding corn were found. The position appeared impregnable, but the Indian guide told them that the Spainards took it and that the despair of the people was so great at its capture, that they threw themselves headlong into the frightful abyss below. The perils of life, he remarks, in a town like this or like Cristone, must have been considerable; infant sports had to be restricted within doors; and habits of intoxication could not have been indulged in, as a cool head was indispensable to avoid the fatal consequences of a slip or fall.

Another ruin was found on the river Chama, near Abiquiu, which was one of those elevated towns. They were told that near the walls skeletons might be found, which they could hardly credit, as Indians are not in the habit of burying their dead in the immediate vicinity of their towns. The statement, however, proved to be true, for the erosion made by water and the falling away of the earth, revealed places where skeletons existed; one of which was taken out entire and sent to Washington. It had been placed in the grave with the face downward, the head pointing to the south, an interesting and curious fact, as Dr. Yarrow states that he is not aware that this has ever before been noticed in the burial of the American aborigines. There is a superstition among the Indians that those who disturb the bones of the dead usually suffer ill-luck or perish violently. Mr. R. J. Ainsworth, the topographer, when he was removing this skeleton was admonished of this belief by his Indian guide, and three days afterwards the unfortunate gentleman was killed by the accidental discharge of a pistol in his own

hands, a circumstance calculated to impress still more deeply upon the Indians this prevalent superstition.

The explorers endeavored in vain to find from the Indians living in the vicinity of Abiquiu, some tradition regarding the town and burial places, but all they could say was, that it had been built during the time of Montezuma, and that their oldest people had never heard from their ancestors that any people had ever lived there. The indications here also were that this part of New Mexico had formerly been densely populated. In the Valley of the Chama alone they found the ruins of six or eight towns.

Grave mounds were examined upon the coast of South California, in Santa Barbara county, by an expedition dispatched from the survey for this purpose; and also by Mr. Schumacher, who last year furnished us with the interesting account of his explorations in Peru. When the Spaniards first visited this region the entire coast was inhabited by a vast number of Indians, and their grave mounds and the ruins of their villages exist from one extent of it to the other, but at the present day not even a remnant of these tribes remain. The grave mounds extend over a period long before and after the arrival of the Spaniards. A great number of articles were found, some sculptured with artistic skill, and, amongst other interesting objects, quantities of glass beads, which Dr. Rau has identified as of Venetian workmanship.

Lient. Burney met with extensive ruins on the right bank of Las Animas River, twelve miles above its junction with the San Juan, and 517 rooms were counted in one pueblo alone. These ruins covered what had formerly been quite a town, but my space will not allow me to go farther into the details of this very interesting discovery.

#### THE BLACK HILLS.

The report of the existence of gold fields in the Black Hills of Dakota and Wyoming, led, during the year, to a large emigration of miners to this region, threatening serious conflicts with the Sioux, to whom it was reserved by treaty. The government, in consequence, dispatched a strong military expedition under Lient. Col. R. J. Dodge, with which was connected an efficient scientific corps for geographical and geological explorations; the object of the exploration being to remove the miners from the Hills and to effect a treaty for the purchase, if possible, of the country from the Indians. The expedition reached the south-west slope of the Black Hills, upon a tributary of

the Cheyenne, about 120 miles due north of Fort Laramie, from whence an opportunity was afforded to the scientific party to pursue their researches in the surrounding country; and another camp was established near French Creek, the route between being through a beautiful mountain country, where there was pure water in the streams, and abundant game in places.

The miners were driven out, but the expedition failed to effect a treaty for the purchase of the country, the Indians demanding an exorbitant sum. The scientific party, however, under Prof. W. P. Jenny, spent five months in the Hills and made an extensive examination of the country, mapping it from Belle Fourche to the South Fork of the Cheyenne river.

This exploration confirms the accounts given heretofore of this valuable region. The valleys are well adapted for agriculture and the cañons for stock raising; the rainfall is plentiful, timber abundant, and Prof. Jenny says the Hills will support thousands of miners when the government opens them for settlement. The gold fields are almost wholly in Dakota, extending about fifty miles north and south from Harney's Peak, and covering an area of at least 800 square miles. The most valuable gold deposits, however, are found in the valleys of the streams which drain this area, the gold being derived from the disintegration of quartz rock. These gold fields are not sufficiently rich, however, to be worked in the usual primitive manner, but to be remunerative will require a moderate outlay of capital.

The Black Hills, says Prof. Jenny, rise like an island from an ocean of grass and tree-covered plains. The wind in passing over these plains gathers moisture, which it parts with as rain, when coming in contact with the elevated region of the central portion of the hills. The climate is very healthy, although the amount of land suitable for cultivation is limited as compared with the vast area of the hills. Along the streams and in most of the valleys, however, the soil is deep and fertile, and Prof. Jenny was of opinion that at least  $\frac{1}{10}$  of the 3,000 square miles is arable land, and that the slopes of the hill-sides, though not arable, will afford good grazing, as throughout the whole area there is a luxuriant growth of the finest grass, making it a region exceedingly well adapted to the raising of cattle.

A writer in the *Herald* describes the country through which the expedition marched as one of unsurpassed beauty. Valleys, he says, were passed, watered by a thousand springs running into streams,

which wound their way through the verdure beneath the woods that mantle the hill-sides. There was no evidence that the Indians had ever lived in those hills, the reason suggested being the great prevalence of thunder storms and the frequency with which the trees are struck by lightning. The highest point—Harney's Peak—is about 7,400 feet above the level of the sea. The general level of the rest is from 500 to 1,000 feet lower. The valleys, however, cutting through the hills, are 2,000 to 3,000 feet below the peak. On the west, extending north, is a broad mesne or table-land. Harney's Peak, with its surrounding peaks, seems to be the true center of the hills; but this whole mountain region is exceedingly elevated as well as the drainage system. A remarkable feature in the geography is the many long and deep cañons through which the streams flow, the cañons being exceedingly impressive from their depths and their magnitude. They range in depth from 200 to 600 feet. The topographical work and the mapping was done by Dr. V. T. McGillicuddy and Capt. H. P. Tuttle, and the geology of the hills was worked up by Mr. I. Newton of this city. The geographical features of the region are especially interesting; and the scenery, which is startling and impressive, abounds in remarkable natural objects, of which photographs were taken. We expect, in the course of this winter, to have an evening when Mr. Newton, the geologist, will give us a detailed account of this exploration with stereopticon views of its remarkable scenery.

Capt. Ludlow, U. S. E., whose reconnoissance in the Black Hills of Dakota I referred to last year, has made his report to the government which contains both a geological and geographical map of the hills and an extensive detail of valuable geographical information.

#### HAYDEN'S SURVEY.

The United States Geological and Geographical Survey of the Territories, Prof. F. V. Hayden, geologist, in charge, continued its work in Colorado Territory.

The six field parties left Washington June first, Mr. Jas. T. Gardner, geographer, having general charge of the field work. One of the parties was organized for triangulation, one for photography and four for geological and topographical works. They remained in the mountains till November. Some 25,000 square miles were surveyed in the south-western corner of the territory, which is an especially interesting region. The elevated and massive part of the Rocky

Mountains terminates here in the San Juan group of ridges where over fifty peaks exceed 13,000 feet in altitude and many reach 14,000 feet, their slopes being rich with silver and gold veins. The lofty and desolate heights which cover so much of this area and the hostility of Indians successfully repelled "prospectors" until 1872 and 1873. Since then over 3,000 gold and silver claims have been discovered and recorded. Heretofore the richest ores have been packed upon the backs of mules and shipped to Denver at great expense, but during the past season roads were completed which penetrate the wildest districts and capitalists are preparing to send in large quantities of machinery. The survey has already published a preliminary map and a geological and topographical report upon this very promising part of our territory. Around the mountains, contrasting strongly with their precipitous slopes and fine forests, sweep the great desert plateaus of Western Colorado, Arizona and Northern New Mexico; formed largely of horizontal cretaceous rocks, whose level-looking table-lands are intersected with labyrinths of rock-walled cañons, from a few hundred to 6,000 feet deep. The almost inaccessible ledges and caverns of these cliffs, are in places lined with ruined dwellings of a race now nearly extinct, known as the Pueblos, or town building people. The work of the survey in discovering many of these ruins, mapping their positions, making measurements and plans of the buildings, with photographs to illustrate the different kinds of masonry, and collections of skeletons, implements, pottery, etc., forms one of the most interesting parts of their labors. A number of large and perfect water jars were found and brought to Washington. Thirty-six different kinds of ornamentation were counted on the pottery at one ruin, upon which trees grew not less than 300 years old. The buildings were of hewn stone. No trace of metals was found. The implements were stone axes, chisels, etc. Where chopped wood was seen, the work appeared to have been done with stone.

The survey of Colorado is completed, excepting a small part of the north-west corner. The Sierra La Sal Mountains, where Mr. Gardner's party was assaulted by Indians, are not known to have been visited before by whites. With six armed men and six unarmed assistants, Mr. Gardner penetrated this heretofore unexplored region, and after leaving the mountains was attacked by twenty-five or thirty mounted Indians in a waterless valley walled with cliffs. The party were already suffering from thirst and were searching for water when

assailed. It was only after nineteen hours fighting that they succeeded in escaping up the rocks by a deer-trail. They were two days and a night without water in a desert climate, where men require ten or twelve times as much water as here. By out-manceuvring the Indians and fighting, like them, under cover, the explorers saved their lives.

Mr. Jackson, with the photographic division, visited the Moqui towns in Northern Arizona, inhabited by a remnant of the Pueblo race. He obtained many interesting pictures of the people and houses, with collections that illustrate their customs and arts. A preliminary map accompanies the Hayden Report for 1874, giving, in a generalized form, the topographical results obtained up to May, 1875. The final maps are being engraved on a scale of four miles to the inch, and will not be published under a year. Large models have been constructed of parts of the mountains and of the most important ruins; so that those who cannot visit them may thoroughly understand their appearance.

#### PROF. J. W. POWELL'S EXPLORATION OF THE COLORADO.

Professor Powell's exploration of the Colorado river, which was heretofore carried on under the direction of the Smithsonian Institution, now forms the second division of the United States Geological Survey of the Territories, the geographical department being in charge of Prof. A. H. Thompson. Prof. Powell, with a small party in the field, has accomplished a great deal, but before referring to the labors of the past year, I desire especially to express the society's high appreciation of Prof. Powell's recent admirable report upon his exploration of the Colorado river and its tributaries from 1869 to 1872. The graphic and lucid account he has given of the singular country of the cañons, has enabled me for the first time to get a clear and general conception of this extraordinary region, and of the physical causes — operating slowly over long periods of time — that have produced it. He has also, in this publication, and by his collections and ethnological researches, added largely to our knowledge of Indian races, their pursuits, mode of life, customs and history.

The exploration last year was, to a large extent, under the direction of Prof. A. H. Thompson, the geographer of the division. The main party was engaged in exploring a region little known — the south-eastern corner of Utah — and another portion of it was studying a region about 200 miles south of Salt Lake City, having an area of from 5,000 to 6,000 square miles, composed almost wholly of vol-

canic rocks, and presenting the volcanic phenomena upon a great scale, highly varied and complex. The central point of operation was Gunnison, a small Mormon town, 140 miles south of Salt Lake, where the great Wahsach range of mountains terminate. This investigation was chiefly geological, but its geographical features are interesting. Its scenery is wonderful and very impressive. A striking feature is the lofty plateaus, which have led Prof. Powell to call it the plateau country. Of these plateaus the Aquarius is the loftiest and most extensive, covering an area of nearly 10,000 square miles, from the Henry Mountains on the north to the Kaiparowitz Plateau on the south, and the Colorado river on the east to the Aquarius Plateau on the west. Although the Sevier Plateau is the one where the volcanic features are the most extensive, having been the scene of volcanic action for a very long period, and continued intermittently until a period comparatively recent. This volcanic region is in marked contrast with the surrounding country. It is from 2,000 to 6,000 feet higher, sharply cut by deep gorges and ravines, but never by cañons. The loftier positions are well wooded and watered, with abundant grass and game and a rich soil close to the lower part of the mountain slopes; but it is a rugged country, where travel is obstructed and observation difficult. Capt. C. E. Dutton of the Ordnance Corps, whom I presume to be the author of an article in the Tribune from which these facts are derived, says that a month's journey through the country proved both delightful and instructive. With the exception of one small valley the whole region is uninhabited. The climate is too rigorous for much agriculture, and in the higher valleys few nights pass without frost, few days without rain or snow, yet the luxuriance of the Alpine vegetation is remarkable. "We tread knee deep," says the writer, "in long succulent grasses with many flowers looking as if their proper place was a hot-house." The rivers, lakes and small streams are alive with trout. Many streams that lead down the volcanic precipices form, in the midst of the mountains, a lake of the clearest waters called Fish Lake, which lake and the streams forming it are filled with salmon trout. They refuse the hook, but the streams are so small, pebbly, and the number of fish so great, that one may stand astride in the stream and throw them out rapidly with the hand. The common brook trout is very abundant and caught with the hook, baited with grasshoppers.

Prof. Thompson's party discovered the ruins of many pre-historic dwellings, and also on the cañon wall escarpments many Shi-ni-mo

etchings and inscriptions which were copied. During his journey Major Powell met some tribes of the Shoshone Indians, whose arts were unrepresented in the National Museum at Washington, enabling him to make collections of their arms, clothing, implements, etc., by which these Indians will now be as fully represented in that museum as the Utes or Piutes. Mr. F. S. Ward, the botanist, made large collections bearing upon the geographical distribution of plants, and Mr. J. K. Hilliard made numerous photographs for geological and ethnographical purposes. I close my account of this interesting exploration with Major Powell's observation, that the result of this year's labor had been more satisfactory than those of any previous years.

### PRE-HISTORIC.

#### ANCIENT INHABITANTS OF AMERICA.

Other explorations and expeditions have been made during the year in reference to the pre-historic inhabitants of America, for the detail of which I am mainly indebted to Prof. F. W. Putnam, the archæologist of the Peabody Museum.

Dr. Farquharson has examined a number of mounds near Davenport, in Ohio, resulting in the discovery of numerous articles, such as pipes carved in the form of various animals, copper axes covered with cloth, the fibers of the cloth showing the high state the mound builders had attained in the art of weaving. Mr. Strong has also examined mines near Kent, Michigan, and has discovered a number of implements. Mounds have been explored by Mr. H. Parry on the St. Clara river, in Utah; by Mr. H. Gilman on the river Rouge, in Michigan; by Prof. Andrews, in Ohio; and by the Kentucky Geological Survey, near Cumberland. In the latter exploration a fragment of painted pottery (which is unusual) was found. A human tibia, found by Mr. Gilman in the river Rouge mounds, is the flattest yet discovered. Archæological Societies have been established in Ohio, Indiana, Tennessee and Wisconsin for the further prosecution of these inquiries.

The memoir of the late Prof. J. Wyman, upon the shell heap mounds and pre-historic remains on the St. Johns river in Florida, close to the Atlantic coast, has been published during the year by the Peabody Academy of Sciences. It is an exhaustive memoir not only in relation to the pre-historic remains in that locality, but for the large amount of information brought together to show the extent to which cannibalism prevailed among the earlier inhabitants of North



and South America. The shell-heap mounds on the St. John's river, are the remains of a people who were neither agriculturists nor hunters, but who lived upon shell-fish. This is evident from the quantity of the shell-mounds and the rude state of the arts among these people who are supposed to have been of the Carib race. Fragments of pottery were found, although not in the oldest mounds, and also fire-places and tools, and implements of stone, bone and shell; stone implements, however, being rare. Human bones were found, but so broken and distributed as to make it obvious that they had not been deposited in graves, but were the remains of cannibal feasts. The age of these mounds can be fixed only approximatively. Trees growing over them, and other indications, show that they existed at least two or three hundred years before the discovery of Florida. Drinking cups were found made from the conch shell which exists so abundantly upon the Atlantic and the Gulf coast. These drinking cups and other objects made from these shells, are traced not only through Florida but up the Mississippi and its branches to the great lakes, showing that there must have been, among the aborigines, a large traffic in these drinking shells, which, it is supposed, were all made either in this Florida mound region, or on the shores of the Gulf of Mexico.

Prof. J. D. Whitney, from the remains found by him in California, is of the opinion that man existed there as long ago as the tertiary period; that he was then the maker of instruments for grinding corn, as well as other implements of stone, and, as far as the examination of the imperfect skull, which was found, warrants a conclusion, that he was, at that remote period, the same anatomically as he is now. These discoveries of Prof. Whitney's go to show that man existed during the glacial epoch, which is confirmed after seven years examination of the deposits in the Victoria Cave in England, and by recent discoveries in the inter-glacial coal beds of Switzerland. The glacial epoch is computed by Mr. Croll, in his recent work, to have ended about 80,000 years ago; and Mr. Croll is not only one of the best authorities, but the one whose estimate of the time is the lowest.

It is said that M. Greenbot, in plowing land in-Bass county, Kentucky, during the year, discovered the remains of a city with regular streets, curbed with stone, and evincing a higher order of civilization than any other pre-historic remains in the country. It is also said that at Palatka, in Florida, upon the grounds of Col. Hart, a mound was opened, containing a carefully constructed chamber, in which

petrified bodies were found in an upright position, with arms, implements and other objects. These statements, however, rest entirely upon newspaper reports, which are so frequently fabricated that they cannot be accepted as true accounts of actual discoveries until the facts are confirmed.

The researches and discoveries made this year alone, in respect to the pre-historic races of America show how extensively this subject is undergoing investigation, and what a flood of light has been shed upon it. Thirty years ago I attended a public lecture in this city, together with the late Drs. Hawks and Francis, by a gentleman who had given great attention to the subject, and there were five persons present.

### BRITISH AMERICA.

The Abbé Petitot, who has been engaged since 1862 in missionary labors along the course of the Mackenzie river and in the country adjacent to the Great Bear and Great Slave lakes, laid, during the year, before the Paris Geographical Society, a large amount of information respecting this region, and of the researches of various travelers, whose information is not represented upon existing maps. He says that Mr. Bell, in 1840, was the first who penetrated into Alaska from the Arctic side of the Rocky Mountains. The Abbé's account is too extensive to enable me to give in my discourse even an epitome of it. I can only say that he has corrected a great many errors furnished a large number of new facts, and that he is one of that numerous class of valuable missionaries who have done so much for geographical knowledge while occupied in their religious labors.

### CENTRAL AND SOUTH AMERICA.

The surveys for a ship-canal from the Atlantic to the Pacific; the one by Lieut. Collins, by the way of the river Atrato, and the other by Commander Lull, across Nicaragua, have been completed, and the reports of these officers will be published by the government. Lieut. Collins' account has already been laid before the Society, and I shall defer any further consideration of the subject until the government reports have been published.

Prof. Wm. M. Gabb has continued his exploration of Costa Rica, which has heretofore been confined to the Atlantic slope, but which he purposes to extend to the country bordering on the Pacific Coast. He has surveyed Tolamanca, from the borders of civilization on the north, to the borders of Panama, and from the Atlantic to the crest of the

Cordilleras, a rich agricultural country peopled only by 1,266 Indians. His ethnological researches and collections in natural history are exceedingly valuable.

A *boiling lake* has been discovered in the island of Dominica, two miles in circumference, on a mountain covered by a forest, 2,500 feet above the level of the sea. The water which rises four feet above the general surface, and pours over the sides with a sulphurous vapor, is charged with sulphur and decomposed rock; and as the surface is gradually becoming lower, Mr. Presto, the observer, is of opinion that the lake will be gradually destroyed and converted into a geyser.

Mr. Marguin made an exploration in Terra del Fuego, from 55° 20' to 52° 50' S. lat. chiefly by water, from Cape Expectation along the eastern shores of Dawson Island, and from thence to Terra del Fuego, as far as Philip and Gente Bays, and has given an interesting account of the geography, geology, climate and inhabitants of this inhospitable region, where winter prevails for nine months of the year. He had some intercourse with the inhabitants, who he says are not as large nor as strong as the Patagonians. The marvel is that human beings should be found inhabiting this extreme region, where the struggle for existence against the climate is not only terrible, but in addition the people are exposed to constant attacks from the savages of the coast. A narrow channel in this quarter, from the Atlantic to the Pacific, is said to have been recently discovered 150 miles in length, and is said to be navigable. If this should prove to be true it will greatly shorten the passage between the two oceans, as the present route through Magellan's Straits is 315 miles. A British frigate, the *Opal*, has been detailed to investigate it.

The expedition dispatched by the Hamburg Geographical Society under Captain Dolman, has made an exploration of Graham Land, in the Antarctic, and where Bisco, the discoverer of that land, in 1832, saw nothing but a continuous coast line, Captain Dolman discovered a strait fifteen to eighteen nautical miles wide, with highlands between as far as the eye could reach, and also an archipelago of islands, sixty nautical miles in extent, which he has called King William's Land.

## ARCTIC.

The important Arctic event, during the year, has been the dispatch of the expedition so long urged upon the British government by the Royal Geographical Society for the discovery of the Pole and scientific research. It is under the command of Captain Nares, who, until

recently, commanded the *Challenger*, and consists of two ships, the "Albert" and the "Discovery," one of which is in charge of Commander Markham, who, it will be remembered, returned in the "Dundee" with the remainder of the officers and crew of Captain Hall's expedition. The expedition left last June and has taken the route by way of Smith Sound, the one followed by Kane, Hayes, and Hall, and uniformly urged by this society as the best. This is a marked change in English opinion. Admirals Osborn, Inglefield, Sir Lionel McClintock and Mr. Clements R. Markham, the Secretary of the Royal Geographical Society, have heretofore advocated this route, but the great body of Arctic explorers and geographers in England have, until recently, agreed in opinion with Dr. Petermann, the eminent German geographer, that the most practical route by which to reach the Pole was east or west of Spitzbergen. The result of Hall's expedition, however, in sailing unobstructed through Smith Sound and Kennedy and Robeson Channel to  $82^{\circ} 16'$  north latitude, has entirely changed the current of opinion, and Dr. Petermann, together with the great body of the English Arctic explorers, have, with great unanimity, united in recommending that this English expedition should go through the Smith Sound, following up the track of Kane, Hayes and Hall. The expedition when last heard from had a favorable passage into Smith Sound, and, as it is well equipped and under an experienced Arctic explorer, Captain Nares, great hopes are entertained that it will succeed in reaching the Pole, either by water or by sledging, but whether or not, the scientific researches to be made will entirely warrant the sending of it out.

Before its departure a crowded meeting was held of the Royal Geographical Society, at which the officers of the expedition were present and most of the distinguished Arctic explorers, several of whom expressed their views, in a lengthened discussion, of great interest upon its objects and prospects. Admiral Richards paid a high compliment to our people. No people, he said, had shown a greater interest in Arctic exploration; that when all further hopes were abandoned by the English in the direction of the North Pole, a restless and enterprising spirit existed with us, and that we persevered for years until we accomplished results which he said must be admitted by all to have been at least unsurpassed. Admiral Ommann, formerly a prominent opponent of the route now adopted, also said that England must be grateful to her American cousins who had cleared the way by successful operations through Smith Sound.

When it is remembered that our early efforts in this direction were ignored, that the name of Grinnell Land in Wellington Channel was at first omitted upon English maps and the name of a subsequent English explorer substituted, that our route by the way of Smith Sound received little support except from Admiral Sherrard Osborn, Admiral Inglefield and Mr. Clements R. Markham, this change of opinion and hearty recognition now, is very gratifying, especially to our member, Dr. Hayes, the only one of our exploring commanders in the Arctic who is now alive.

Admiral Richards recommended the plan uniformly advocated by Dr. Hayes, that one vessel alone should endeavor to push northward to the Pole, leaving another in a safe position to communicate with in the event of disaster. He was of opinion, from what is known, that there is no continent or great mass of land in the polar area north of Greenland, and that if navigable or partly navigable water were found, it was possible that short work might be made of reaching the Pole; but if there was continuous land, along the shore of which sledges could travel, then a very high latitude or probably the Pole might be reached by sledging, although the distance to be accomplished by sledges and boats combined, would necessarily be a very limited one. He remarked that all that human foresight could devise had been done to ensure success, and that the design of the admiralty was, that if the expedition did not return before 1877, a vessel would then be sent to Smith Sound. Admiral Collinson thought that by following the land they would get further north than had yet been attained. Admiral Sir Lionel McClintock was of opinion that if the vessel reached as far as Hall's —  $82^{\circ}$  — which would be within 500 miles of the Pole, and such ice was met with as was commonly found in Lancaster Sound, that the expedition would, without doubt, reach as far as the Pole, and having had himself great experience in sledging, he made a very valuable statement as to the most practicable way in which the sledge expeditions should be conducted. Captain David Gray was of the opinion that Smith Sound was merely an inlet, as the tide there rises eighteen feet, with southerly winds, whereas on the south of Melville Bay, the rise and fall of the tide was only between five and six feet. He thought that this high tide was the result of the southerly wind forcing the water up a narrow inlet, and that if there was any connection between Smith Sound and the Polar Sea, the tide would bring the ice down, but that if the tide was met at Cape Frazer then Smith Sound must communicate with the polar basin.

## NORDENSKJÖLD'S EXPEDITION.

A Swedish Arctic expedition, under Prof. Nordenskjöld, was dispatched last summer in the "Proven" at the expense of a single individual, O. Dickson, Esq., of Gottenborg. Its object was to pass around Nova Zembla and the north and go as far as the mouth of the Obi and the Yenisei, which, it was supposed, would be rich in the bones of the mammoth and in prehistoric remains. The vessel arrived at the southern part of Nova Zembla on the twenty-second of June last, and being unable from the ice to get to the northward, some weeks were occupied in zoölogical, geological and botanical researches, when the vessel sailed southward and succeeded in getting through the Zugorski Shar, the straits between Waigatz and the mainland of Northern Russia, into the sea of Kara, which they found wholly free of ice, and by dredging and observations for temperature, ascertained that no warm under current exists in the Kara sea. They penetrated as far as 75° 30' north latitude, when they sailed for the Yenisei, which the professor and his friends ascended in a boat to Dudinka, a village where Prof. Nordenskjöld left the Proven; the vessel returning to Norway, while he made his way across Siberia to Tomsk, and from thence to St. Petersburg, where he was warmly received by the Imperial Russian Geographical Society.

The expedition ascertained that there was a fine harbor at North East Island, and found the mouths of the Obi and the Yenisei quite free from ice, and though shallow, sufficient for the establishment of trade between Europe and Siberia; which will enable the rich products of Siberia to find an outlet along her great rivers. They landed at a place in the mouth of the Yenisei, known as Christowski, formerly inhabited in summer and winter, where they saw houses, which, judging from their interior fittings, must have been once handsome residences. There were three of those dwellings with flat turf-covered roofs, each of which the professor says, in his report, had a labyrinth of dwelling apartments, bake-houses, bathing places, store-rooms for provisions, fuel, etc. Every thing was in great confusion; no furniture was to be seen; even the nails had been taken from the walls, and when they reached Dudinka, they learned that the inhabitants of the place had left it some centuries ago. Gortschiga was found to be the most northerly inhabited place on the Yenisei, which was occupied by a small number of fishermen and hunters. The natives of the region were Samoyedes, Dolganes and Ikutes. The river had a great variety of fish, of which they collected a number of specimens.

They were still north of the limits of the polar circle, which might be supposed to be a region covered with ice and snow, but on the contrary they found the vegetation most luxuriant and beautiful. The great richness of the grass fields in fact excited the remark of one of their companions, a farmer-fisherman at home, that it was a pity that God had given so splendid a country to the Russians where there was no one to cut the grass; an observation constantly repeated when they came to the splendid woods and rich black soil between Jeniseisk and Turnchausk, a region wholly uninhabited, which for fertility the professor says may be compared with the best parts of Sweden, and is larger in extent than the whole Scandinavian Peninsula. They heard in their journey that three different Russian expeditions had been dispatched for the exploration of the country. Though north of the polar circle they found what he declares to be the finest timber upon the globe, and south of these forests there stretches a fertile soil waiting for the husbandman and the plow. I have, he says, before me while writing a cluster of magnificent Siberian grapes which is strange news of a region heretofore supposed to be dreary and barren from its proximity to the pole. Prof. Nordenskjöld says: I entertain the most profound conviction that a new commercial route has been opened, the importance of which can only be adequately conceived by a knowledge of the vast tracts of country watered by the Obi, the Irtysh and by the Yenesei and their tributaries. The return of the *Proven*, from the course of the vessel, indicated a strong north-westerly current flowing from the mouth of the Obi and Yenisei over the Kara Sea. The examination of the sea showed that the bottom was uncommonly rich in animal life and marine vegetation, which is interesting, for the Kara Sea has heretofore been represented as devoid of all vegetable life, for vegetation on the land is exceedingly scanty, the surface conveying the impression of utter desolation. The commander of the *Proven*, Dr. T. Kjellman, writing to Stockholm, says: "We have, during the summer, sailed over known and unknown seas more than 6,000 English miles, have visited regions where expeditions for more than 300 years have vainly attempted to go, and have made rich collections in all departments of natural science."

A marine survey is being made by the Russians of the coast of Eastern Siberia, from the Imperial harbor to Plaston Bay, and astronomical positions and levels have also been taken in the same vicinity.

## VOYAGE OF THE PANDORA.

An expedition fitted out at the joint expense of Captain Allen Young, Lady Franklin and Mr. James Gordon Bennett, the proprietor of the *New York Herald*, consisting of a single vessel, the screw steamer *Pandora*, left on the twenty-fifth of last June for the purpose of exploring Lancaster Sound, and to reach, if possible, King William's Island, that a more thorough search might be made for the relics of Sir John Franklin's expedition. The steamer had what is unusual, a fine passage through Melville Bay, and though on entering Lancaster Sound, a large barrier of ice was found, Captain Young was able to get around it by an opening along the southern shore. The *Pandora* then reached Bechey Island, where they found the yacht which Capt. Ross had drawn up there on the beach in 1850, still in good condition, with masts upright, and upon going on shore, they examined the storehouse which had been built for the benefit of castaway or ice-bound sailors. Upon entering the building, the clothing and provisions left there were in the greatest confusion. Every thing was scattered about as though by human beings, but upon further investigation it proved to be the work of polar bears, the track of these animals being visible in every direction, inside and outside of the building, which they had broken open. The milk was well preserved, but had lost much of its virtue in twenty-two years. One of the sailors of the *Pandora*, now an old, grizzled, weather-beaten sea-dog, had been with Ross, and had assisted to build this house, which was now carefully repaired and secured against further attack from the bears. They found the headboards over the graves of Sir John Franklin's men, still upright, and the monument over the grave of Lieut. Bellot, the young Frenchman, who lost his life in the search for Sir John Franklin. The vessel then sailed for Peel Sound where she encountered large fields of pack ice, through which, however, she worked her way, passing the farthest point reached by the *Fox* in McClintock's search, and steamed down the coast of North Somerset in fine weather, with warm air currents, and an open expanse of water, which created the most intense excitement, from the hope that they might find the traces of Sir John Franklin's expedition, perhaps discover his papers, and possibly make their way out through Behring Straits, but upon reaching Roquette Island, within ten miles of Bellots Straits, they found a solid pack of ice stretching across the strait, and blocking up the entrance into Bellots Straits. King William's Island might have been reached, as it was then but 150 miles distant, but as



this would have involved the risk of wintering in that region, and the vessel was provided with provisions for only one winter, Capt. Young prudently determined to return whilst he had the opportunity, and to make another attempt in the same vessel the coming summer. He brought with him the letters left by Capt. Nares, the last intelligence we have had of that expedition and of its successful entrance into Smith's Sound. The Pandora, although it did not accomplish all that was aimed at, penetrated further into Peel's Sound than had been effected by any other vessel.

#### GENERAL ARCTIC MATTERS.

Capt. Gunderson, of the schooner *Rejina*, discovered on the north coast of Nova Zembla in excellent preservation the journal kept by Barentz, the Dutch navigator, in his voyage 295 years ago, the entries in which were up to the first of June, 1580. The journal does not relate to his last voyage which was from 1596 to 1597. The Norwegian government has organized an expedition which is to go out this year for the scientific exploration of the sea between Iceland, the Faroe Islands, Spitzbergen and Jan Meyen. Dr. Rink, who has given great attention to the geography of Greenland, thinks that the continent might be crossed from coast to coast; that it probably consists of a number of islands held together by the universal ice-covering; that the so-called interior ice is probably only a wall, within which may be found valleys, free from snow or ice, and possibly even wooded. Icebergs, in the North Atlantic have been unusually numerous during the year, and the fogs in Labrador and Newfoundland extraordinary and frequent. Lieuts. Weyprecht and Payer, of the late Austrain expedition, have, in a recent publication, expressed their conviction that there is no ground for assuming the existence of an open sea at the pole, nor for inferring the existence of the Gulf Stream in these waters, from the drifting of their ship, and they say that a passage to the east, taking the Siberian Coast in that direction, has not been negatived by the experience of their expedition.

The geographical results of the Polar expedition continue to be worked out by Dr. Bessels. The magnetic observations are more complete than any hitherto made in the Polar regions; the observations upon tides were made with great care. The current in Smith Sound running southward, was at a rate which varied from one to five miles, carrying with it much drift wood, which was coniferous, indicating that it came from a cold climate. The fauna and flora of Hall's

Land was very rich, but nearly all the specimens collected were lost. Drift wood was found at an elevation of 1,800 feet above the sea, along with shells and mollusks, which still exist in the water below, very positive evidence of either the gradual elevation of this part of Greenland or of a great change at a former period in the sea level. Many erratic blocks were seen, not borne by glaciers, but transported by floating icebergs, indicating that at one time the current in Davis' Strait was from south to north, which is different from what it is now ; and Dr. Bessels believes that Greenland has at some time been separated from the American Continent, in a direction from south to north.

A Dutch Arctic expedition is about being organized by influential members of the Dutch Geographical Society, residing in the ancient town of Enkhuizen, with the object of renewing, if practicable, the Arctic whaling business formerly carried on so extensively in Enkhuizen, Middleburgh and other of the dead Dutch cities, the trade of which is now limited to a small commerce in herrings and the making of the cheese so well known throughout the world. The design is to connect with the whaling business the advancement of science, a thing entirely practicable as the maritime people of Holland, as a rule, are well educated, and the commanders of vessels are frequently men of considerable scientific attainments. It is something that the Dutch are considering the subject of Arctic exploration, for though proverbially slow to move when once started they rarely relax but quietly go on to the attainment of the end. A people so practical that they seldom trouble themselves to think about any thing deliberately unless there is something in it ; and when a Dutchman ponders over a matter you may be tolerably certain that something practical will be the result. They have heretofore been among the most eminent of Arctic explorers, and it will be gratifying to see them again in the field where their forefathers have won such well earned laurels.

An expedition for exploration between Greenland and Spitzbergen is organizing in Germany to be sent out in 1877, but its departure will probably depend upon whether aid will be given by the government. The plan is to establish a principal station at the west coast of Greenland, and minor stations on Jan Meyen Island, and at the western extremity of Spitzbergen where provisions can be kept.

An expedition from this country has been talked of, under the command of Capt. B. S. Osborn, this spring, in which practical navi-

gators only are to be allowed to join. I know nothing about it, however, except from statements in the newspapers.

### SYMMES' HOLE.

About the year 1819, Capt. J. C. Symmes, an officer of the regular army of the United States, advanced a theory, to the propagation of which he devoted the remainder of his life, that the earth was hollow, was inhabited within and had an opening at the pole, which became known throughout the country as Symmes' Hole. He pressed the subject upon Congress, urged an expedition to the pole to test his theory and a Russian gentleman is said to have offered to fit one out if Symmes would conduct it under the auspices of Russia, which the captain declined on the ground that the honor of establishing the theory should belong to the United States. He went over the country delivering lectures in support of this theory, in which he firmly believed to the day of his death. His son, now an old man, has revived it, and is advocating it as his father did by delivering public lectures. The father's theory was that this hole, or opening, in the Arctic was about 1,000 miles in diameter and somewhat wider at the Antarctic; and now that we have reached within 500 miles of the Arctic pole, about half of the assumed diameter of the hole, without any indication so far of its existence, the son believes that if Capt. Hall had got several degrees further north he would have found evidence of the truth of the theory.

Capt. Hall startled us at the reception given to him and his officers by this society, before the departure of the *Polaris*, by announcing publicly to us his belief in the existence of this hole, and of his determination to go in pursuit of it; a belief which, being an uneducated man and but little acquainted with the geography of the Arctic, was firmly fixed in his mind. It was in pursuit of this supposed hole that he meant to attempt the passage to the Pole by the way of Jones' Sound. I pointed out to him the impracticability of an attempt through Jones' Sound, and urged him to go as Kane and Hayes had done, by the way of Smith Sound, which course he ultimately adopted when advised to the same effect by Baron Van Otten of the Swedish expedition, whom he met during his voyage at Holsteinberg in Davis Strait.

In a letter put forth last February by Mr. Symmes, he not only argues that the earth is hollow, but that it has as much inhabitable surface within as without. He imagines that the inside is inhabited

by human beings who are the progenitors of the white race now upon the outer surface, and that there are apertures at the poles four or more hundred miles in diameter. This recalls the belief as to the cause of the earth's motion in the middle ages, when it became apparent from the researches of Copernicus and Galileo that it revolved upon its axis, which accounted for the motion by supposing that the interior of the earth was hollow, and was the place to which the damned were condemned, who produced the motion by their continual attempts to climb up the inside of this hollow ball in their fruitless efforts to get out. A wood-cut representing this strange belief will be found in an old cosmography in our library.

Another contributor to this realm of imaginary geography is a former Arctic explorer, Capt. J. M. Wood of the royal navy, who accompanied Sir James Ross in 1848, and whose theory in a recent letter is, that Sir John Franklin was lost in a maelstrom which swallowed up his whole party in the immediate vicinity of the Pole; the belief of the captain being that there is an open sea at either Pole; that Franklin, when his vessel was blocked by ice, set out in sledging parties to reach the Pole and discovering open water ventured upon it, when he found himself involved in rapid circling currents, which became stronger near the Pole, until he was finally drawn into the vortex of a gigantic whirlpool, where the boats were either engulfed or incessantly whirled about until they were crushed to pieces. This rotary motion at the Pole, he supposes, is produced by the moon's attraction, causing two sweeping tides, once in every twenty-four hours, which in other parts of the earth are resisted by the continents, but which, at the Pole, he assumes to be a continually lessening spiral of revolving waters, forming towards the center his imaginary maelstrom. I mention these circumstances to show that even in this scientific age, theories are seriously advanced with about as much to support them as the crudities advocated in the middle ages.

Dr. Rick, the great Danish authority upon the Arctic, has published an interesting work upon the tales and traditions of the Esquimaux, and is of the opinion that they are an indigenous people who have been pushed northward by intrusive Indian tribes. Mr. C. R. Markham, in his recent work on the Arctic, maintains that they entered America from Asia by Behring Straits, being driven in that direction by the pressure northward of hordes from Central Asia. This is not, however, the prevailing opinion among American ethnologists who have studied this question, such as Dr. Davis, Robertson, Dall and

others, who think there is no satisfactory evidence of an Asiatic origin — at least in that direction.

## **METEOROLOGICAL AND EARTHQUAKE DISTURBANCES.**

The winters in Russia are becoming colder and the summers warmer, which is attributed to the great destruction of forests in the southern part of the country. The injurious effects of the extensive destruction of forests is awakening a great deal of attention in Europe, and several works have appeared upon the importance of their preservation. I have frequently before referred to this subject, and to the consequences that will follow in our own country from the reckless way in which our forests are destroyed. The present irreclaimable condition of certain parts of Asia and of Northern Africa, once thickly inhabited, has arisen from this cause. A marked decrease in the volume of European rivers has also been observed, partly through this cause and the melting of glaciers. The waters of the Danube are said to have disappeared some fifteen miles below Donaueschingen. It will be remembered that terrible inundations occurred last June at Toulouse and the country in its vicinity in the south of France, as well as at Buda-Pesth, in Hungary, in both instances attended by an enormous destruction of life and property. The rate of propagation of the waves of inundation in France along the borders of the river Garonne, was found to be two miles an hour, in a run of 140 miles, through the districts where the principal calamity occurred, showing that if a system of signal warnings had been established through a country so exposed as this part of France to inundations, much of the disastrous effects, especially in the loss of life, which has been estimated as high as 3,000 persons, might have been averted. This most destructive inundation in France is attributed to an unusually heavy rainfall, the melting during the previous part of the summer of the snow and ice upon the mountains, and to the large destruction of the forests, the forests previously having had a great effect in equalizing the distribution of water, and in preventing a too rapid melting of the snow and ice whilst the growth of timber upon the hill-sides prevented a too rapid flow of surface-water.

Great attention has been given during the year to the study of the tides and their causes, whether due to the moon, to the sun or to other influences of a meteorological nature. Prof. Hennessy, of Dublin, in opposition to the views of Sir John Herschell, maintains that land has a greater effect in throwing heat into the general atmosphere

and distributing it over the earth than water. The heat, he says, penetrates the water to considerable depths, and being there absorbed the surface of the water never acquires a very elevated temperature, even at the equator. His conclusion is, that of all substances, water is the best adapted for the absorption and distribution of solar heat throughout the external coating of the earth. In this respect he agrees with Mr. Croll in his recent work upon Climate and Time, that it is the distribution of heat by oceanic currents, flowing southward or northward from the equator, like the gulf stream, which is the cause of the mild temperature of certain countries which, but for this cause, would be uninhabitable.

Meteorological disturbances in the form of hurricanes upon land, destructive gales at sea, cyclones, etc., have, during the year, been very extensive and of unusual severity. A hurricane passed over the Philippine Islands, which destroyed more than 4,000 dwellings and by which 240 persons were killed. Another hurricane swept over the Island of St. Vincent, in the West Indies, accompanied by a deluge of rain, unprecedented, even in that part of the globe; the rain coming down in an unbroken sheet of water for twelve hours, and reaching, it is said, the unparalleled amount of nineteen inches. The hurricane was preceded by an intense and oppressive heat, and streams, which the parching heat had left dry, became roaring torrents. Houses were carried away, landslides occurred and a large part of a graveyard, with the bodies interred, was swept into the sea. In the same month (September), one of the most formidable cyclones that has been known upon our coasts for years, occurred at Galveston, Texas, and in its vicinity, during which 174 persons lost their lives, and Indianapolis and other places were covered with the wreck of stores, dwellings and churches.

Storms and rain-falls of unusual violence have also occurred in our Western States, in England, in other parts of Europe and in Persia; and earthquakes have occurred in our own country at Washington and Macon, in Georgia, and in Knoxville, Tennessee. They have occurred also at Cucuta in New Granada, Guadalajara in Mexico, in Algeria, in Barcelona, at Broussa in Asia Minor, at Sanghur in India, and at Ravena in the Loyalty Islands; and a volcanic eruption, in which the earth was rent to a considerable distance in a number of fissures, occurred in Norway. For some time past in Sweden great attention has been bestowed on the observation of clouds, and the meteorological societies of several nations are now

co-operating with Sweden and sending the result of their observations there for investigation. M. Monchez, who has recently been investigating the subject, has arrived at the conclusion that the movement of air in cyclones is always from below upward, while in whirlwinds the movement is from above downward; that the wind descends from the clouds in the form of a bag, terminating in a point, and that water-spouts have no connection with cyclones but result from a different cause.

### VOYAGE OF THE CHALLENGER.

The voyage of the Challenger, to which I have heretofore so frequently referred, has been continued. Soundings were taken for temperature in the middle of the Chinese seas, which at the depth of 1,200 fathoms was found to be 36° Fahrenheit. This temperature is accounted for by a barrier that rises to within 900 fathoms of the surface of the water and cuts it off from the Atlantic. From there the vessel sounded off the western coast of Lucon and made a run of about 2,000 miles parallel with the equator, and thence sailed through the Caroline and the Pedrone Islands to Japan. The greatest depth between the Admiralty Islands to Japan, which is a distance of 2,250 miles, was ascertained to be 4,575 fathoms, or 27,450 feet, the deepest yet found, except the soundings of our own vessel, the *Tuscarora*, off the east coast of Japan, which was to the depth of 4,655 fathoms, but no sample of the bottom was then procured. Thermometers sent down to these great depths were crushed to pieces by the enormous pressure which they had to bear. One, however, withstood the pressure and showed that there was a layer of water of the uniform temperature of 34°.5 Fahrenheit, occupying the bottom of a trough of the ocean of the enormous thickness of 18,450 feet. The Challenger is now on her way back to England, to which she will return this spring after one of the most important scientific voyages ever made by any vessel. Great attention is now paid to the study of physical geography in the colleges and universities of Europe. During the year Baron Richthofen, the Chinese traveler, has been appointed Professor of Geography in the University of Bonn, and Dr. Wagner, editor of the *Almanach de Gotha*, received a like appointment in the University of Königsberg. We should not be behind other nations in view of the great practical importance which this science is now assuming; and it is to be hoped that Columbia College, as it is the principal college in this the chief maritime city of the continent, will establish such a professorship.

## EUROPE.

There is comparatively little to state in respect to Europe. I do not know what progress has been made, if any, in the projected measurement of an arc of the meridian from Sweden to Sardinia.

## DRAINING THE ZUIDER ZEE.

The project which has been entertained in Holland since 1849, of draining the Zuider Zee by converting it into dry land, which was reported upon favorably in 1873, by the commission to whom the consideration of the project was entrusted, has at last been resolved upon, and the Dutch chamber have granted the necessary funds for the commencement of the work, which I suppose has been begun. No people, ancient or modern, have done so much by artificial means to overcome the difficulties of nature as the people of Holland. Their whole country which lies twelve feet below the level of the sea, and which would be inundated but for the great dyke or sea-wall which they have erected, and constantly maintained is a monument of their energy, foresightedness and perseverance. In 1851 I rode along the Harlem Meer or lake and looking out upon this expanse of water, twelve miles long, seven miles wide, and fourteen feet deep, I saw three hydraulic engines at work pumping out the water, and wondered at the enterprise and perseverance of a people who could engage in such an undertaking. I passed over the same spot the summer before last, and saw the space covered with thriving farms and villages, which I had formerly seen as a great sheet of water, and from inquiries made in Amsterdam, learned that the government had been fully reimbursed for its outlay in the value of the recovered land. But the draining of the Harlem Meer is a small work compared with the gigantic undertaking of the draining of the Zuider Zee, which embraces an area of 759 square miles, 485,775 acres of which would be fertile land. The total area of the Netherlands amounts only to 12,679 square miles, and this will increase it to the extent of nearly six per cent. In the time of the Romans, what is now the Zuider Zee, was a comparatively small lake, the *Lacus Flavus*, or the *Fleda* of the Dutch, which communicated with the Baltic Sea by a narrow channel. In 1282, after one of those catastrophes which has so frequently swallowed up whole districts upon the eastern shores of the German Ocean, the present Zuider Zee began to form by the intrusion of the ocean, and successive disasters continued to enlarge it until 1476. A vast amount of country was



thus submerged, involving the destruction of farms, villages and towns, and the lives of an enormous number of human beings. During these two centuries a productive district of country, of about 1,500 square miles, was entirely covered by the water of the ocean and rendered absolutely useless. But this was not all. The sea thus formed was not even serviceable as a means of communicating with the land by water, as its navigation was exceedingly difficult and dangerous. It is a dull waste of waters, with low marshy borders, in which it is not only difficult to distinguish the shores in certain places, but it is filled with shifting shoals, against which the navigator must be constantly on the watch. It is only Dutch sailors, familiar with it during life, who can at all navigate it, and even to them it is perilous. The effect has been that the once flourishing towns around its borders, which were formerly among the principal commercial ports of the Netherlands, became practically useless for the general purposes of commerce, and their trade and industry having greatly declined, and in some cases having entirely passed away, they have come to be known by the expressive appellation of the dead Dutch cities.

The work of draining this large inland sea will be begun by constructing an immense dyke 164 feet wide at the bottom of the sea, and rising to a height of twenty-six feet above it, which will extend from Enkhuizen, one of those old decayed cities, to the small island of Urk, and from thence it will be continued to Kampen; making a total length of wall near the narrow opening of the sea, of twenty-five statute miles. The enclosed area, shut out from the sea by this great wall, will be divided into squares and the water pumped out, while navigable canals will connect Amsterdam, Hoorn, Edam, and other places with the waters of the Atlantic. The expense of the work will be \$48,000,000 or about \$100 an acre; and as the draining of the Harlem Meer occupied more than ten years, it must be many years before this great undertaking will be finished. Not only have the Dutch drained the Harlem Meer and begun this greater undertaking, but, to overcome the difficulties of the navigation of the Zuider Zee, they first constructed the long ship canal from Amsterdam to the Helder, which, not being found sufficient for its purposes, they have just finished a still greater work, the wide and deep canal from Amsterdam directly to the German ocean; one of the greatest pieces of engineering work, in view of the difficulties overcome, of modern times. Amsterdam whose commerce had for years been declining, has now become as accessible as any of the commercial ports of

Europe; and the effect of this canal upon its prosperity has been most rapid. When I visited Amsterdam in the summer of 1874, I found the quaint, picturesque and stationary old city that I had seen twenty-three years before, so changed into an active, busy, commercial metropolis, that as I moved about its streets, or walked along its canals, I could scarcely realize that I was in the place that had been so strongly imprinted upon my memory.

Mr. Watts ascended the Vatnajökël in Iceland, to a higher point than has heretofore been reached by any traveler, and was to resume his researches over parts of the island yet unexplored, and where exploration is difficult and dangerous. Dr. Faurel, of Lausanne, has been investigating the oscillatory movements of the surface of the lake of Geneva, and which occurs upon other Swiss lakes, the result establishing what was before inferred, that it was due to variations in atmospheric pressure.

## ASIA.

### PALESTINE.

A great deal has been done during the year in Asia. The total area now surveyed by the British Palestine expedition, is 4,430 square miles, which leaves 1,500 to complete the survey of Western Palestine. A map of the whole country this side of the Jordan will be prepared this year. The American Palestine Exploration Society's expedition has been actively employed during the year east of the Jordan in a reconnoissance of Moab. It has made a skeleton map of Moab and taken one hundred photographs of objects of interest.

### ARABIA.

In mentioning in one of my former addresses the military occupation by the Turks of Yeman, that fertile and interesting part of Arabia, I remarked that no good would come to the country from Mohammedan possession and rule. That apprehension has been verified. A recent writer complains of the manner in which the Turks govern this recently annexed territory. Nothing is done, he says, to advance education or improve schools. Various tribes have been driven to revolt through the mal-administration of the government, and during the four years of the Turkish occupation £900,000 has been levied in taxes, not one penny of which has been used to advance or develop the resources of the country. What the Turks are now meditating is to bring the districts of Sade Yam and Mareb under the same unfortunate rule.

## SIBERIA.

Mr. Schekanofsky and Müller have given an account of the Olenok expedition in Northern Siberia, to which I have previously referred. They started from Erbokhoger,  $61^{\circ} 16'$  north latitude, and proceeded along the valley of the lower Tunguska, but owing to the depth of the snow and the great severity of the cold which was as low as minus  $45^{\circ}$  centigrade, their progress was very slow. They arrived at the confluence of the Kopokit and Olenok rivers and crossed the massive mountain chain of Anaon, and reaching  $66^{\circ} 26' 30''$  north latitude, when they came upon a large stream, the Moniero, and returned after many trials and difficulties by the way of the Olenok river. Their journey was chiefly of a scientific character, having reference to the geological, botanical and meteorological features of the country.

## EASTERN RUSSIA.

Dr. E. Tietzi has made a journey through the provinces of Ghelan and Mazanderan, which comprise the northern slopes of the Elburz range, and a flat strip of coast land between it and the Caspian, and found proof that the sea formerly extended to the foot of these mountains, by the examination of rocks, which bear the imprint of the lashing of the waves.

It has been decided by the Russian government that the route of the railroad over Asia should be from Nijni Novogorod to Kazan, Ekaterinburg to Tiumen, which I suggested would probably be selected as the best one geographically, to ultimately reach Peking by the way of the Desert of Gobi. Mr. Polgakow made a journey for the exploration of the region of the upper Volga, and from his observations, came to the conclusion that the upper course of the river must have been joined to the lower and middle course, accidentally.

The expedition which has been long in preparation for the survey of the old bed of the Oxus, left last June to enter upon its work, and Messrs. Solimani and Moshkof have found Lake Aral to be 242 feet above the Caspian, and 157 feet above the Black Sea. The height of the Caspian above the Black Sea was assumed to be 86 feet.

Major H. Wood, who accompanied the Russian expedition, for the examination of the ancient bed of the Oxus, has expressed the opinion that the change in the river, by which its mouth has been diverted from the Aral to the Caspian Sea, was brought about by the obstruction of its waters for the purpose of irrigation, especially in Kivah, and that if the river had not thus been interfered with, it would have continued in its course to the Caspian.

## TURKESTAN.

A Russian expedition left Tashkend last April for the exploration of Hissar, or as far as the Oxus. The route of the expedition was through Samarkand, Karshi and Baisum to Hissar, a country but very imperfectly known, our knowledge of which has heretofore been derived solely from ancient writers, for no modern European traveler has ever trodden its soil. The expedition ascertained that the rivers Khuziar, Dargas, and Shirabad were not the magnificent streams they had been represented to be. They found that the Sirshan is an important tributary of the Oxus, the very existence of that river having been doubted by Fedchenko, the late Russian traveler.

They discovered the remains of the remarkable stone bridge over the Sirkab, described by Clavigo, the Spanish ambassador to the court of Timour, in the fifteenth century, but were not able to identify the position of the famous pass of the iron gates, a great natural opening closed by folding gates cased with iron and hung with bells, described by the Chinese Buddhist Missionary, Hwen-Kisang, in the seventh century, and which pass Clavigo described as impregnable, though the gates were not then there. They visited all the towns of any importance, and the result of their expedition will be an accurate map of the territory of Hissar and Kulab, based upon points, determined astronomically.

M. Vamberg, whose journey to Turkestan was our principal information respecting it and the cities of Samarkand and Bokhara, prior to the Russian military expedition, has given a very interesting account of a journey from Samarkand to Shehri-Sebz, by the Russians. Shehri-Sebz or the green city of former times, is the birth-place of that great conqueror, Tamerlane or (Timour-Leng), and was, he says, five years ago known to the outer world only through an obscure veil of hearsay and fiction; but now, by the strange changes in history, the birth-place of the famous conqueror of Moscow, who had slain and led into captivity thousands of Muscovites, is, after a lapse of 500 years, conquered by the descendants of those Muscovites and opened to the knowledge of the civilized world. In the autumn of 1874, three Russians, Mr. N. Magef, editor of the *Turkestan Gazette*, M. Krivtsof, a photographer, and M. Bektchuran, made an excursion to Tamerlane's birth-place, which is about thirteen German miles from Samarkand. On reaching the valley of Shehri-Sebz and of the gardens which surround the towns of Kitab and Sherar, they found that this district, which, in the middle ages, was

famed for its fertility, is at the present day not equal in fertility to Khiva. On three sides it is hemmed in by groups of mountains. The town of Kitai, which has a citadel, taken by the Russians, and has a square and a bazar, they found to be now dirty and poverty-stricken. After a rain, the streets are a foot deep in mud, and the whole appearance of the district confirms the accounts of the extraordinary marshiness of this part of Central Asia. They found, however, gardens, meadows and cultivated plots of ground, occurring in unbroken succession, in which fruit was plentiful; and say, that if it were not for the warlike spirit which has distracted this part of Asia so long, the native land of Tamerlane would now be more densely populated than even in his day. They also visited Shehri, the second city of the valley. Here the diplomatic representative of Henry III, of Castile, was entertained at the court of Tamerlane in 1405, and, upon his return, he gave a glowing account of the palace upon which builders and artificers had then been employed for twenty years, and described the high and broad entrance to its gardens, adorned with glazed tiles of different hues, as well as the beautiful galleries and reception halls, adorned with ivory, azure, silver and gold. They found these ruins still very fine and exceedingly interesting. They saw the dome that once crowned the building which can still be recognized, though it has fallen from the walls, which were covered with the remains of inscriptions, elaborate mosaics and other decorations, relics of the power and splendor of that mighty Asiatic conqueror, whose fame, for so many centuries, dazzled the imagination of Europe, and whose deeds furnished the material for the English drama of Marlow, and the French tragedy, associated with his name.

Monsieur Barbeau de Marney, with scientific associates, has been engaged in a geological exploration of the region watered by the Ama Daria, and furnished an elaborate account of the result to the Imperial Russian Geographical Society last March. The information supplied is geographical as well as geological, but the details are too numerous to enter upon. He closed his exploration after a journey of 1,400 miles on horseback, at Samarkand, which he declares to be one of the most remarkable places in Central Asia, not only to the archæologist and the historian, but also to the geologist.

#### CHINA.

Mr. R. A. Margary, who established a high reputation as a geographer and explorer, by his journey from the China Sea to the Ira-

waddy, by the way of Younan-Fu and Momien, started on a journey from Anko, up the Yang-Tse Kiang, for the purpose of meeting the expedition from British Burmah, under Col. Browne and Mr. Ney Elias, an expedition undertaken to establish more extensive commercial relations between Burmah and China. Mr. Margary's route was by boat from Hankow, along the Yang-Tse, to Tung-Ting Lake, and through the lake to the province of Quichow, where navigation ends; and then by land journey over the magnificent passes of that mountainous province to Younan-Fu. But this enterprising explorer was murdered after having reached Younan-Fu, and the journals kept by him probably have not been saved.

Monsieur Du Bernard, a missionary, made a journey in China to the savage tribes of Lissu, who are nominally subject to Chinese rule, but their intercourse with China and Thibet has not changed their savage nature, as they make raids on surrounding tribes and live on these incursions wholly by rapine. He was well received by these savages, though they refused to comply with his mission, which was to induce them to release their prisoners. Gold is abundant in the country and small gold balls are the recognized currency, weighed in Chinese scales. Their religion is purely fetichism.

I have heretofore frequently referred to the Abbé David's exploration in the northern regions of China, in which he has gathered a great deal of geographical information, and his botanical collections and observations as a naturalist have been exceedingly valuable. Among other explorations he reached Moupin, on the frontier of China proper, which, until recently, was not to be found upon the maps, and which is inhabited by a race differing both from the Chinese and the Thibetans, though resembling both. The country forms a part of the Himalaya range, and is covered with lofty mountains, clad with perpetual snow. Among other discoveries of this cold region, where the snow is on the ground for six months in the year, were monkeys in the woods, in large troops, an animal heretofore found only in the warm latitudes in the vicinity of the equator, and which differs from the monkeys with which we are familiar, in the adaptation of its form and covering to its cold northern home. The hand, instead of being long and slender, is large and thick; the arm, instead of being long, is comparatively short and very muscular. The hair, on the older animals, is four inches in length and is of different colors, grey, reddish, black, and yellowish, and the conformation of the head indicates a higher intelligence than that of other monkeys. The

nasal region is deeply depressed, and the opening of the nostrils is very large, with the nose turned up at the point. He also found in the same region other monkeys who hide in caves, like the apes of Algeria or Gibraltar, which were once very numerous, but have been so extensively destroyed for their skins that they are now rarely met with.

Monsieur M. Dupois has made an exploration of the Hong Kiang or Red River of Tong-King, in China. As a means of communication he is of opinion that it will prove of great importance for the purposes of trade, and that the commerce would in a few years attain at least half the magnitude of that of the Yang-Tse, as it would open up communication between the south-west provinces of China and Leos and Thibet, the population of which countries amount to an aggregate of about fifty millions.

Dr. Hermand, a French traveler, has given an interesting account of Tong-King or Tonquin, the country upon the gulf of that name, or that part of Annam which lies between Cochin China, and the great range of mountains that separate it from the southern part of China. Dr. Hermand describes it as a country of great fertility and densely populated. The people are represented by him as a mild and inoffensive race who are greatly burdened, as the country is heavily taxed to make up for the sterility of the rest of Annam. He found the mandarins exceedingly hostile to Europeans, and pictures them as cunning, ignorant, and given to intrigue and exaction. He says that throughout the whole course of administration, from the humblest officer to the highest, nothing can be obtained without a present. There is but little commerce, which is in the hands of the resident Chinese, whose chief occupation is that of money-brokers. The mountains which surround Tong-King are inhabited by a number of savage races of whom comparatively little is known, but are evidently the aborigines of the country. The mountain region to the north-west is infested by banditti, chiefly Chinese, living by plundering the unprotected inhabitants of the plains, who have to keep constant watch along the roads and the approaches to the towns, to preserve what they possess from these mountain marauders. It is the old story of the difficulties that retard the progress of civilization—the struggle between savage and civilized man when in proximity, in which civilized man is the final victor. A French Roman Catholic missionary furnishes a very full account of one of the provinces, Thank-hia, in which there are, in a population of 1,200,000, 15,000 Roman Catho-

lies, a very large proportion of Christians for any part of eastern Asia. The seaport upon the coast, he says, is visited from March to December by shoals of whales, who are not caught or utilized but held in religious veneration by the people. A handsome pagoda is erected upon the coast to their honor, and when a dead one is washed ashore they give him a funeral, interring him with solemn religious rites. If the French missionary has not confounded the enormous blackfish which abounds in these waters with the whale, and there are really whales in such numbers in the Gulf of Tong-King, I apprehend, that when this intelligence reaches Sag Harbor, New London, and New Bedford, our captains will very soon be enlarging their knowledge of the geography of the Gulf of Tong-King, and will greatly shock the religious prejudices of the Annanites by an exhibition of the kind of interest they feel in this sacred object of Annanite worship.

Baron Richthofen, the geologist and Chinese traveler, after a careful examination of the subject, and after fully considering the doubts of the Abbé David, estimates the present population of China at 415,000,000. He considers the government census to be much more reliable now than it was formally, and explains that the census is taken by hanging tablets outside of every house on which the names of all the members are written, whether present or absent, and as there are overseers to every hundred houses the work is simply one of addition.

#### MONGOLIA.

Capt. I. A. Sosnoski, a Russian, has attempted to make his way from China to the Black Irtysh, in Siberia, but by which route or with what success is not yet known. The sources of the Black Irtysh, which rise in Western Mongolia, were first explored by him in 1872, of which I formerly gave an account. The Irtysh being the western branch of the Obi, and indeed the larger of the two, is a river of which we simply knew that it flowed from Lake Zaisan, on the border line which separates Asiatic Russia from Mongolia, and that a river flowed into the lake from Mongolia in the Altai range, which being in fact a part of the same great river was called the Black Irtysh to distinguish it from the part which unites with the Obi and forms the river that flows into the gulf of Obi, and is one of the great rivers of the world. Of its remote eastern source, in Mongolia, we knew comparatively nothing until it was explored in 1872 by Capt. Sosnoski, the officer now attempting to reach the Black Irtysh by proceeding from Hangkou, in China, to Kulja, in eastern Turkestan, a very



formidable journey across China and Mongolia. The country of the Black Irtysh has also been explored by Mr. Molusooski, a Russian, embracing the Ektag range of the Altai to the country of the Kal-mucks, on one of the most easterly head rivers of the Irtysh, a journey of 514 miles, in which he determined various altitudes in this mountain land and collected a vast amount of information respecting the people, the means of communication and the sources of trade. Mr. Morozof, a Russian merchant, dispatched couriers from Lake Zaisan to Dzungaria and western Mongolia, an extensive journey in which great attention was paid to obtaining geographical information, especially in respect to distances and the most practical routes.

#### THIBET.

A large lake, Tengrinor, has been found in Great Thibet, by the half Thibetian Indian explorer employed by Major Montgomery in 1872, to investigate the unknown country north of the Thibetian watershed of the upper Brahmaputra. He crossed the great range, the northern boundary of the Brahmaputra valley, in a north-easterly direction, from Shigatze, and went completely round Lake Tengrinor, the existence of which was simply known from old Chinese authors by that name, but which on the spot is called Lake Namcho, or Sky Lake, and returned by way of Lhasa. He found the streams frozen hard, and was struck by the number of hot springs having a sulphurous smell, the water being ejected with great noise and violence like our western geysers. The lake is fifty miles in length, by some sixteen or twenty-five in breadth, and bounded on the south by a range of snowy peaks 150 miles in length, the highest of which is more than 25,000 feet above the sea. Latitudes and observations of heights above the sea were taken. This exploration has elucidated the geography of an area of 12,000 square miles, and one of the northern tributaries of the upper Brahmaputra has been thoroughly explored.

#### PERSIA.

Captain G. C. Napier has made an adventurous journey in Northern Persia, and found certain parts of it very fertile with heavy crops of cereals. At Shkoh he saw some seams of good coal that can be worked from the surface, but the people were ignorant of its use. He visited Kelat, crossing the main chain of the Elburz mountains, a mass of hard, grey limestone rising with jagged teeth to about the height of 7,000 feet, and paid much attention to the system of irriga-

tion so essential in Persia. He passed several villages on the road to Deregez, inhabited by a fine race very different from the majority of Persians. They were well clothed, ruddy men, who had terraced gardens, well stocked orchards, and fields of waving grain, the most prosperous Persians he had seen. He found valleys, the produce of which would feed whole districts, uninhabited for the reason that they were the neutral grounds between the plundering Turkomans and Kurds. One town, Joh Jarm, that in the time of Nadir Shah had 5,000 families, has now but 400, which is attributed to the devastation of the Turkoman who destroyed the works for irrigation. At Ashrof he found the famous garden of Shah Abbas wholly neglected, the buildings, fountains and stone terraces being all in ruins. Orange and citron trees were growing in wild abundance, their fruit being left to fall and literally cover the ground. Though under the present state of things Ashrof is of little note, it must, he says, be one day the center of one of the most important districts of Persia. Sir Henry Rawlinson, a most competent authority, refers in the highest terms to the labors of Capt. Napier, and says, that when his discoveries are properly worked out they will throw great light on this part of Central Asia.

The Hamburg Geographical Society have organized an expedition for the exploration of Persia, under the direction of Dr. Andreas, an Oriental scholar, thoroughly qualified for the work. The country to be explored is bounded on the north by the road connecting Bushire, Shiraz and Kirman.

#### INDIA.

Mr. Bond of the Indian Trigonometrical Survey, discovered two of the wild dwarfish race, who live in the hill jungles of the Western Gâlit, to the south west of the Palini Hills, a race which, though often heard of, no trace of had previously been found by the survey. A man and a woman were discovered. The man was four feet six inches high, and twenty-six and a quarter inches about the chest. He had a round head with coarse, black woolly hair and dark brown skin, a forehead low and slightly retreating, the lower part of the face projecting like that of a monkey, with thick lips, protruding about an inch beyond his nose; a comparatively long body for his size, with short bandy legs, and arms extending almost to his knees. The hands and fingers were so contracted that they could not be made to stretch out straight and flat. The palms and fingers were covered with a thick skin, particularly the tips of the fingers, the nails being

small and imperfect, and the feet broad and thick-skinned all over. He had a grayish-white, scanty, coarse mustache like bristle, but no beard. The woman, who was about of the same size, was of a yellow tint, with long, black, straight hair, and features well formed as contrasted with that of the man, there being no difference between her appearance and that of the common women of that part of the country. She had an agreeable expression, was well developed and modest. Their simple dress was a loose cloth, and though they ate flesh, they lived chiefly on roots and honey. They have no fixed dwelling-places, but sleep between rocks or in caves, near which they happen to be at night, when they light a fire and cook what they have collected during the day, maintaining the fire during the night for warmth and to keep off wild animals. Their religion, such as they have, is the worship of certain local divinities of the forest. This is a new pigmy race, resembling the African Obongos of DuChailin, the Akkas of Schweinfurth and the Dokos of Dr. Krapf in their size, appearance and habits.

Col. Montgomery gave before the British Association a very interesting account of the gigantic glacier system of the Himalaya range, which, he says, reaches its greatest development in Baltistan in North Western India. The glaciers increase in size from east to west, and are in many instances more than twenty miles in length, the largest, Biacho, being thirty-four miles long. The thickness of the ice was, in some cases, 400 feet, and the experiments made show that the phenomena of motion was the same as in the Alps.

## AFRICA.

### CAMERON'S EXPEDITION.

The chief geographical events of the year, in Africa, have been the exploration of the Victoria N'yanza by Stanley, and the journey across that continent by Lieut. Cameron, from Lake Tanganyika to Benguela on the western coast, about  $11^{\circ} 56'$  south latitude. As Mr. Stanley's journey and its results were fully detailed at our late Stanley meeting, I need not again refer to it. In my last address I gave an account of Lieut. Cameron's exploration of Lake Tanganyika, and of his discovery of its outlet, the river Lukuga, on the western side of the lake. It will be remembered that I mentioned that he had, in May, 1874, with very inadequate means, started westward to discover the source of the Congo, and to follow that river to the sea, and that if, in view of his limited means and the great difficulty of such an

undertaking, he should succeed, it would be one of the most remarkable achievements in the history of the exploration of Africa.

He started in May, 1874, and had not been heard from until the twenty-seventh of last November, when a telegram was received from him at Loando, announcing that he had, with fifty-seven followers, come out at Benguela,  $10^{\circ} 40'$  south latitude on the west coast; that they were all well; that he had been forced by adverse circumstances, to abandon the Congo route, and had, in consequence, followed the water beds between the Congo and the Zambesi. Since that time two letters have been received from him, with an instalment of his maps and scientific observations, which show that although he did not accomplish the main object he had in view, yet that what he did is of great geographical value. His achievement is a remarkable one, for he has traveled, on foot, from Zanzibar to Benguela, a distance of nearly 3,000 miles; 1,200 miles of the journey being through a country of which nothing has hitherto been known, except some vague Portuguese accounts of parts of it. In 1853, an Arab commercial caravan, trading for ivory and slaves, started from Zanzibar and crossing Lake Tanganyika, traveled westward to Benguela on the west coast, in  $12^{\circ} 15'$  south latitude, accomplishing the journey in six months, a knowledge of which led to Burton and Speke's expedition in 1857, in which they reached Lake Tanganyika, and Speke, upon the return journey, discovered the Victoria N'yanza. The route of Cameron appears to have been in the same general direction as this Arab caravan, though he came out upon the coast about a degree or so farther to the north, and had he had at his command the resources of such a caravan, or been provided for like Stanley, he would, in all probability, have found the sources of the Congo and pursued that river to the sea. He did not follow the outlet of Lake Tanganyika, the Lakuga, but went directly north north-east to Nyangwa on the river Lualaba, the farthest point reached by Livingstone, and apparently by the same route. I understand him, however, to say that the outlet of Lake Tanganyika flows into the Lualaba above the junction of that river with two other rivers. He does not appear to have ascertained the fact himself, but from the way in which he makes the statement he is evidently satisfied as to its correctness.

At Nyangwa he tried in vain to get canoes to explore the Lualaba, which, instead of running north beyond Nyangwa as Livingstone supposed, turns to the westward, and, as Cameron heard by report,

then runs to the south-west. He also attempted to cross by land to a large lake, Sankorra, into which, he was informed, the Lualaba flows, and where he was told traders, wearing pantaloons, came in large sailing vessels to purchase palm oil and gold dust, but the chief ruling the country west of the river Lomâmi would not permit him to go in that direction. He also found that Nyangwa, on the Lualaba, was 1,400 feet above the level of the sea, or 500 feet below the level of Gondokora on the Nile, and about 900 feet below the level of Lake Mwtan (Albert N'yanza), which shows conclusively that Lake Tanganyika is not connected with Lake Mwtan or the Nile system as was supposed to be the fact by Livingstone, Burton and Cooley in opposition to the views of other geographers. Cameron also conversed at Nyangwa with Arab traders who had been far to the north-east from that point to Ulegga, which I suppose to be the Balega country mentioned by Livingstone, but they heard nothing of Lake Mwtan in that direction, though one of them knew of the existence of that lake, which adds additional confirmation to the conclusion that there is no connection between Tanganyika and the Mwtan, and led Cameron to believe that the Mwtan is by no means as large a lake as it was supposed to be by Sir Samuel Baker, an opinion confirmed by Col. Gordon's inquiries upon his recent expedition up the Nile in the direction of that lake, to which I shall hereafter refer. Foiled in his attempts to follow the Lualaba in its course, or to get westward on a parallel with the Congo, Cameron made his way along the valley of the Lomâmi in a south-westerly direction to the coast by a route which I find it difficult to trace as the names of the rivers, lakes and places given by him are new to me. He describes the interior through which he traveled, as, to use his own language, "generally a magnificent and healthy country of unspeakable richness." He declares its water system to be one of the greatest in the world, and thinks that a company with a capital of ten millions to begin with, could open up this part of Africa in three years; that the diplomatic difficulties would be greater than the physical ones. He found the head waters of the Zambesi, which he places in 23° E. long., at 11° 15' S. lat., flowing to the south, and says that a canal across the flat level country there would connect the Zambesi with the Congo, but does not appear to have taken into account the cataracts which obstruct the navigation of both the Congo and the Zambesi. Indeed, cataracts have been the chief difficulty in all the great African rivers, for had these rivers been navigable, like the large rivers in

other continents, the regions watered by them would, long ere this, have been peopled by civilized man.

In an independent lake, Mohrya, he found lake villages, which from his reference, I infer to be like the pre-historic lake villages, the remains of which have been recently found in Switzerland and other parts of Europe, or the lacustrine villages now existing in New Guinea. He also met upon his way that curse of Africa—a slave-trader, whom he describes as an unmitigated ruffian, with a string of about fifty wretched women whom he had collected in the villages.

In one of the letters he incidentally refers to the interest felt throughout England, in a work to which, he says, he hopes to devote his life, a passage which has something in it more than mere words, for it recalls the noble body of men, from Mungo Park to Livingstone, who have lost their lives in attempting to open up this great continent to the knowledge of mankind.

#### WEST AFRICA.

We have now a full account of the result of the expedition to which I have heretofore referred, of the Marquis de Compiègne and Monsieur Marche to the Ogowa river in Central Africa; but little was comparatively accomplished from a combination of unfortunate circumstances, such as the extraordinary lowness of the streams, the hostility of the natives and the ill-health of the explorers. The result of the exploration, however, proved that a properly equipped party may penetrate by this route a considerable distance into the heart of Africa. The German West African expedition, which has been in existence since 1873, has met with innumerable difficulties. Dr. Gûsfeldt explored the river Loango up to the falls, but could not get his parties to go any further, as they believed the people of the interior to be cannibals. He afterwards ascended the Niango river to the narrows of Mungo-Niango, in the Balomba country, and then ascended the plateau inhabited by the Baaka.

The Doctor has returned to Europe, and in a recent address before the Berlin Geographical Society expressed the opinion that the obstacles to a scientific exploration of Central Africa upon the south-western coast are insurmountable. There is not only the difficulty of obtaining porters, but innumerable small territories have to be passed, the chiefs of which hinder the advance of Europeans. Astronomical observations could only be carried on in secret, or the

observers would have been murdered by the superstitious natives as magicians.

Mr. A. Watson is an earnest advocate of a central African railroad from Liberia, which would be about 4,000 miles, through a densely populated region. He thinks it practicable from the nature of the country, that it would be remunerative ultimately and would, in his opinion, do more for the civilization of Africa than anything else. I merely state this project, however, as there are numerous difficulties to be considered. Something more must be known respecting the country before such a project can assume any practical shape.

Dr. Menks penetrated to the Okando country, 12° E. longitude, where, among other tribes, he came among some of Mr. DuChailu's dwarf Obongos. After examining the Ogoowai, he is of opinion that it will prove a good highway for inland exploration, and when last heard from he intended to ascend the river eastward as far as possible, and then find his way to the northward.

A French expedition under Messrs. Biazza and Marche has been organized for the exploration of the Gaboon and central tropical Africa, which is to continue for several years. When last heard from the expedition had arrived at St. Louis, on the western coast, had organized their party and started for the Gaboon.

Major Burton has furnished a very interesting account of a former factotum of his in Africa — Selim Aga, an African of semi-semitic Abyssinian blood, who was taken to Scotland at ten years of age, where he learned to speak English, or rather, as Major Burton says, lowland Scotch, and whose fate it was afterwards to wander far and wide over the world, in Europe, Asia, Africa and South America, ever pining for a small cottage in Scotland. Major Burton accompanies his communication with an account written by Selim Aga of a journey made by him up the Congo in 1860, giving a detailed account of what he saw in the different places visited, which is of value now that attention has been especially directed to the exploration of that river, and its supposed connection with the great water system traced in part by Dr. Livingstone. Selim's account is exceedingly well written, but my time would not admit of giving any details of it. I will refer only to one passage. He says he often wondered where all the old clothes go to after they are purchased by the Jews in London, and that the mystery was solved when he went up the Congo, where he saw chiefs and native kings decked out in second-hand livery, adorned with the crests and coronets of noblemen on the buttons, and

other chiefs in old livery coats and marine jackets of the last century. Garments turned inside out, threadbare and glazed by long service, were showily displayed, the African's innate love of finery rendering him indifferent to the defects. This recalls that Lander, in his exploration of the Niger, saw a native proudly strutting about with the cover of a tin can fixed in his head-dress, with the words upon it "concentrated gravy."

The project of an engineer, Mr. Donald McKenzie, has been under consideration in England, to cut a sand-bar that obstructs the mouth of the river Belta, a river on the north-west coast of Africa, near the Canary Islands, which bar, it is supposed, prevents the water of the Atlantic from flowing into the interior of Africa in that quarter. It is assumed that there is a vast depression in that part of the Desert of Sahara, extending from the southern slope of the Atlas mountains on the north, to very near Timbuctoo on the south, and from the high lands of Maghter and Adary, near the Atlantic, to the table lands of Mourzuk and Asben to the east; which depression is supposed to be many feet below the level of the sea and probably the bed of an ancient sea, that dried up when the waters of the Atlantic were cut off by the formation of the sand bar across the mouth of the Belta. An expedition was to leave last September to explore this part of the African coast, and examine the mouth of the Belta; but from recent intelligence the expedition, it appears, has not only been deferred until next spring; but its objective point is to be Cape Mogador, and the exploration of a route from there to Timbuctoo through what is represented by Mr. McKenzie to be a healthy and well-watered country.

The supposition of the existence of a great depression in this part of the Desert of Sahara, is altogether conjectural, there being nothing, so far as I know, in the account of travelers who have crossed the Sahara to Timbuctoo, or in other directions to warrant the assumption of a great depression below the level of the Atlantic; but as a depression has been found in other parts of Africa, there is of course no objection to an investigation. The projectors, however, speak of its existence with great confidence and may have information with which I am not familiar. If it should prove to be true, and this great region can be flooded with the waters of the Atlantic by simply cutting through the bar, at the mouth of the Belta, it would have more to recommend it than the proposition of M. de Lesseps to flood the Libian Desert by letting in the waters of the Mediterranean near



Tripoli. Goods are now brought to Timbuctoo over 1,700 miles of desert, and take four months in their transit. If Mr McKenzie's project should be realized, a journey from London to Timbuctoo might be made in two weeks. Prof. Hennessy, in opposition to the views of others, says that if it were possible to flood the African desert, it would have no injurious effect upon the climate of Europe and would greatly benefit that of western Africa.

## SOUTH AFRICA.

Mr. Mohr, who was accompanied by Dr. Hübner, the geologist, has, during the year, given an account of his journey through southern Africa, in which he carefully determined the geographical position of various places from the coast to the Victoria Falls on the Zambesi, and Dr. Hübner has added an interesting account of the South African diamond fields.

Mr. St. Vincent Erskine, of whose exploration of the Limpopo river I previously gave an account, has furnished the Royal Geographical Society with an account of his journey to Umzila in South Africa. The country he traversed was not particularly interesting, though the vegetation in some places was remarkable. At the borders of Umzila at the Injantombe river, latitude  $23^{\circ} 35'$ , he saw a giant creeper which not only covered the tops of the trees like an umbrella but was also supported by poles until it covered 5,400 square feet. The country about King George's river, which has several affluents that rise at about an altitude of 6,000 feet, he describes as one of the healthiest and finest countries in the world, but the lands near the coast, drained by these rivers, are too unhealthy for Europeans. He descended the Limpopo and found it abounding in fish, but very shallow. He was three days going down to the sea and found the river which flows through a fine alluvial valley navigable for only about sixty miles, and difficult of entry. Fever, he says, prevails all along the coast beyond,  $27^{\circ}$  latitude, but does not extend beyond the foot of the hills, which run generally near the sea, and the vast plateau above, he says is as healthy as the Island of Madeira. He describes the Zulu country or coast as having a high ridge near the sea, with hills rising gradually northward to the Zambesi. The maps of the coast were found to be exceedingly erroneous, containing many mythical mountains and streams. In the course of his journey he came to a peculiar race, living in bark huts and of filthy habits, who wore tails or stumps sticking out behind made of leather ornamented with brass,

which he supposes to have been the origin of the reports which have so long prevailed that there were races or people in Africa with tails, or a kind of human monkey. The report of the men with tails is not yet, however, exhausted. Mr. Ney Elias of the Burmah expedition met an Englishman in Burmah, in the beginning of the year, who had long been traveling in out-of-the-way places in the world; who assured him that he saw, when he was engaged in looking for orchids, on the east coast of Borneo, some very low looking people who had tails about the size of the middle finger, apparently stiff and immovable. He said that these people were not quite black, though of a very low type, like the aborigines he had seen in the northern part of Luzen. He says that the men went naked, but the women wore a slight bark covering, and that upon landing upon another place, on the next day, he found people without tails. Mr. Ney Elias says his informant was a man of a very slight education, who had never heard of men with tails before, and was very much struck when Mr. Elias told him of what had been published in respect to the tailed men. Mr. Erskine found the huts of these dwarfish people, with artificial tails so filthy that he passed the night under a Boabab tree. This tree, or as it is sometimes called the monkey bread tree, is among the largest trees in the world. It is not as high as some other trees, but is frequently found seventy feet in circumference, and in some instances has been found to measure 112 feet. Our California trees are, however, much larger. Mr. J. T. Gardner, our general secretary, measured one that was 142 feet in circumference. Mr. Erskine gives a touching description of the little slave children in the country of the Umgonis, waiting to be sold. We saw, he says, three or four poor little Kaffirs and a lot of dogs lying in the ashes, an undistinguishable mass of flesh, or rather of bones. They give these poor creatures no food. If there are any pot scrapings, they get them, if not they have only such rats and birds as they can catch. He made an excursion to the Tonga mountains, and heard various rumors of ruins, but when additional inquiries were made the narrators were silent. The country, on the whole, is full of interest, and by its exploration a knowledge will be obtained of a vast and healthy region, closely adjoining the port of Soffala. He went upon another expedition well equipped with hunters, bearers and proper instruments, from which I understood he has just returned.

## EAST AFRICA.

The Rev. Charles New, of whose labors in Eastern Africa I gave some account at our late Stanley meeting, made a journey from the river Pangani through Usumbara, onward by the way of Wasegejn and Wadigo to Mombassa. He found the Wasequa to be a numerous, interesting and well-to-do people, engaged in both pastoral and agricultural pursuits. They occupy the district lying between the coast tribes and the Wasagara and the Wanugi. Vugu, the residence of the king and chief town of Usumbara, is built upon the top of a rounded peak 4,700 feet above the level of the sea, the view from which he described as magnificent. Valleys, he says, drop down to great depths on each side of it, and it can only be reached by the steepest acclivities. There are mountain peaks rising one above another until they are lost in the clouds, presenting every variety of shapes; enormous valleys, gloomy ravines and romantic looking glens, dark majestic forests, expanses of tall, waving grass, beautiful slopes, and everywhere patches of cultivated land, with brook streams, and torrents which trickle, murmur, tumble or splash on all sides. The soil of Usumbara is very fertile, rains are frequent and the country never suffers from drought. Almost every thing can be raised and the whole country is declared to be a sanatorium for the future residents of Africa. I am sorry to add that news has been received in London of the death of this highly intelligent and energetic missionary. He was, it will be remembered, the first to ascend to the snow limit of Kilimanjara, and to his researches in this and other journeys, we are indebted for the knowledge of a large and fertile region in this part of Eastern Africa, which is not only very healthy but peopled by a tractable race, and abounding in grand and beautiful scenery. The veteran missionary, Mr. Wakefield, the co-laborer of Dr. Krapff, is still at his post at Mombas on the east coast.

A. Raffray, a French traveler, has been engaged in making extensive explorations in Southern Abyssinia and the Eastern Coast of Africa, the details of which are too extensive to enter upon. He has been more successful than most explorers in that country, and says that the Gallas occupying the portion through which he traveled, believe in sorcery, but have no religion. An Italian exploring expedition to East Equatorial Africa was to start last month for Ankebar, to penetrate from there through the Galla country in a south-west direction, towards the Victoria N'yanza. Bishop Stear, accompanied by Shuma and Suzi, Livingstone's two faithful servants, has left

Zanzibar with the hope of being able to establish a missionary station on the north-eastern shores of Lake N'yassa, and Mr. E. D. Young left England last May for the purpose of founding a similar mission on the southern shores of that lake, the friends of Dr. Livingstone in Scotland, having subscribed the large sum of £12,000, for the endowment there of a memorial station to be named after the brave old explorer, from whence it is hoped that Christianity and civilization will be diffused through the valleys of the Zambesi and its affluents, thus practically following up what Livingstone worked and hoped for in his many journeys. When last heard from this expedition had reached the lake, having brought with them a small steamer with which they were navigating it. Col. Long was dispatched by the Khedive of Egypt with a military expedition to explore the river Juba and the imperfectly known country through which it flows. When heard from, last November, Col. Long was encamped two and a-half miles from the mouth of the Juba and eleven miles south of the equator. He writes that the mouth of the Juba is wild and stormy, as the waters of the sea and the river meet there in angry conflict. He explored the river for 150 miles finding it deep, rapid and filled with crocodiles. The vegetation was luxuriant; monkeys abounded along its banks, and as he ascended he saw crowds of ugly naked women and occasionally beautiful Abyssinian girls. He is to be succeeded by Col. Gordon who was then *en route* to open a road to the eastern coast and to establish some form of government there, it being evidently the design of the Khedive to extend the dominion of Egypt over this part of Africa and possibly over the whole of Abyssinia. We learn with great regret that our corresponding member Munzinger Bey, a Swiss by birth and one of the best informed men in respect to Abyssinia, was murdered during this expedition, but under what circumstances we have not learned.

#### NORTH-EAST AFRICA.

Dr. Nachtigal has given some additional information in respect to Wadai, one of the regions traversed in his great journey, of which I have previously given an account. He fixes the population of the country at about two and a-half millions, and says that the surface elevation of the land is from west to east with an elevation of from 1,000 to 1,500 feet above the sea level. Numerous small streams flow from the eastern heights falling into the two principal rivers, the Kafa and Peaka. The country is divided into seven provinces;

the religion is Mohammedan and the king, whose power is arbitrary, is looked upon as a sort of divinity. The king's harem consists of about 500 wives, and all his sons, except the heir to the throne, are blinded with hot irons, a duty performed by the king of the smiths who is also the surgeon of the harem. The people are skillful workers in iron but given to the drinking of an intoxicating beer, a practice which great efforts are made to repress. Spies are extensively employed for that purpose, and any man upon whose premises the forbidden liquor is found is punished by having his wife's head shaved. The king has an army of 40,000 infantry and 6,000 cavalry and the country is heavily taxed for the support of the king and his expensive government.

Dr. Nachtigal read, during the summer, a very interesting paper upon his expedition from Lake Tschad to the upper Nile. This great African lake covers an area of 10,500 square miles and is in the form of an irregular triangle. Two-thirds of the interior of the lake, he says, is occupied by land, on the central islands of which live several tribes. He considers that the waters of this great lake are not wholly due to the rain-falls or to the neighboring streams, but that a great part of them come from a long distance, and it is a curious fact that there is no outlet to so great a lake. He gave many interesting details in respect to the natives, and urged the utility of repeated expeditions to this part of Africa, to open up the way alike to a peaceful and profitable commerce, and the enlightenment of an interesting and energetic people.

#### COL. GORDON'S NILE EXPEDITION.

One of the objects aimed at in Col. Gordon's military expedition, between Gondokora and the Victoria N'yanza, was to trace the Bahr el Gebel, or White Nile, to its supposed outlet in Lake Mwutan (Albert N'yanza), and then, by means of a vessel which had been carried up in sections, to explore the lake and settle the question whether it has any connection with Lake Tanganyika, the Lualaba, or the great water system south of it. To do in fact what Mr. Stanley contemplated doing, with his little vessel the *Albert*, when he had finished the exploration of the entire coast line of the Victoria. Col. Gordon had not, when last heard from, succeeded in reaching Lake Mwutan, the disturbed condition of the country, and the murder of the interesting young officer, Col. Bellefonte, the bearer of Stanley dispatches, requiring the colonel's services and that of the armed

force under him in another direction. The native information he received respecting the Mwutan, both with regard to its magnitude and as to its direction, is very different from the impression of Sir Samuel Baker. It is that, instead of running north and south, as it is represented on Sir Samuel's map, its principal extent is east and west, and that it does not extend as far south as the equator. We should now probably have known all about this lake but for the illness of the officers especially charged with this branch of the expedition, and from the disturbed condition of the country, which may interfere with Stanley's plans as it has done with Col. Gordon's. If the colonel has, as is probable, a sufficient military force to overcome the natives occupying the imperfectly known country between the Victoria and the Mwutan, the exploration of the latter lake would no doubt be undertaken either by himself or by Stanley. Colonel Gordon's expedition has, however, resulted in a more accurate knowledge of the country west of the White Nile above Gondokora. Mr. T. Kemp, of the expedition, who was chiefly charged with the conveyance of the sections of two vessels for the navigation of the Mwutan, has made an interesting geographical report of the country lying between Regaf and Dufli, from which latter place it was supposed the White Nile would be navigable to its supposed outlet from Lake Mwutan. They appear by the report to have got as far as Dufli, up to which point the bed of the Nile was very rocky, with steep banks covered with large rocks. Great difficulty was experienced in conveying the boats above the cataract, as the natives would give no assistance. They succeeded, however, in getting beyond the cataracts, and were at Dufli putting the sections of two boats together, when the further operations of the expedition was interrupted as before stated. Lieutenant Chittendale has given an account of the explorations made in the journey beyond the cataracts of the Upper Nile towards Lake Mwutan, which is important, as he received confirmatory information from a chief, whose territory extended from Lake Mwutan, that the river above consisted of two branches, one of which came from Lake Mwutan, by which it was always possible to enter the lake. Lieutenant Chittendale thought that there was probably a large island at the entrance of it, which would account for two rivers flowing from it. This information is of great interest, as it is all that has been received since Sir Samuel Baker's discovery of the lake.

Sir Bartle Frere, in a letter to the President of the Royal Geo-

graphical Society, speaks in the highest terms of Col. Gordon, and of what he has accomplished. Sir Bartle says that every one states to him that Gordon has really checked the slave trade, and still more, the slave hunting, and that the expedition will pay for itself through the Colonel's economy and judicious management of the conquered districts.

Col. Gordon had been joined by Herr Marno of the Vienna Geographical Society, an experienced African traveler, whose object was to explore the west and east ends of the Mwutan, as he considers it not improbable that the lake may have another outlet at the south-west angle. Two outlets of a lake is rather an exceptionable thing in geography, but it may well occur in Africa, where the lakes, especially the more shallow ones, are greatly swollen in the rainy season, and the water rapidly accumulating, may find an outlet at a higher elevation and in another direction from the one through which it flows when the lake is at a low level. Herr Marno made an exploration about 150 miles south-west of Lado, and came within sight of the mountain which Dr. Schweinfurth had seen to the eastward in his journey to the country of the Nyam Nyam. Herr Marno when at Ghab-Shambil on the Bahr el Gebel, in about 7° north latitude, saw a female of the Akkas, the dwarf or pigmy nation that dwell south-west of the farthest point reached in the Nyam Nyam country by Dr. Schweinfurth. A male of this extraordinary diminutive race, Dr. Schweinfurth brought with him upon his return journey, but the Akka died just before reaching the Nile, and another was brought to Italy by the late Signor Miani, but this is the first female, at least of the Akkas, that has been seen. Herr Marno believes that Dr. Krapf's Dokos, Mr. DuChaillu's Obongos and Dr. Schweinfurth's Akka, are the same race, and are the aborigines of Central Africa. DuChaillu's Obongos have, as I have said, been seen by another African traveler, Dr. Menks, during the present year, and Mr. DuChaillu's account of them fully confirmed. Herr Marno was invited by Hassam Ibrahim to go into the Nyam Nyam country as far as the home of the Akkas, and probably intended to do so by proceeding westward after exploring Lake Mwutan, but from intelligence recently received he appears to have returned down the Nile. Col. Gordon has made Lado the station on this part of the river instead of Gondokoro, with which we have been so long familiar. Gondokoro was built upon an eminence about twenty-five feet above the Nile, which flowed at the bottom of the bank. The

river, however, afterwards changed its course, leaving what was formerly its bed in front of Gondokoro a stagnant and fever-breeding marsh, and it is the present unhealthiness of Gondokoro which has led to the selection of Lado, a few miles farther down the river.

#### NORTH AFRICA.

Col. R. L. Playfair has given an account of the exploration of the Aurès Mountains, a comparatively unexplored region in North Africa, the natives of which, he says, are clearly of European descent, many Latin words being still used by them. They live in stone houses, and Roman remains are met with in all directions, indicating a high state of civilization when the Romans occupied the country. There was a great extent of cedar forests and lead was to be found in abundance. The women, he says, are of singular beauty, and, unlike other Mohammedan women in North Africa, never conceal their faces.

A French expedition has been fitted out by the Chamber of Commerce under Mr. Largeau, to go from Algiers to Rhadames, with a view of opening up a communication and trade between the Soudan and Timbuctoo. Mr. Largeau departed last March for Rhadames or Ghadamez, as it is sometimes spelled, an oasis in the central part of Sahara, and Mr. P. Soleillet, who had previously explored part of the Sahara, has undertaken a journey to Tusalah, the principal city of the Touaregs. More than 10,000 French have emigrated to Algiers from Alsace and Lorraine, and the European population there is increasing not only by emigration but by the excess of births over deaths.

An Italian expedition, under the Marquis Antinori, went to Tunis to examine the Roman monuments in that country and also to survey the Isthmus of Gabes in connection with the project of introducing an inland sea from the Mediterranean into the Sahara. Capt. Roudaire who had been directed by the French government to make a survey to test the practicability of this project reported that the problem could not be solved until the depth of the portion about Tunis was ascertained and the Isthmus of Gabes thoroughly investigated. This has now been done. A report was made last June to the Italian Geographical Society of the result of the survey by the Italian expedition. The report was to the effect that the country had been minutely observed, that the proper levels had been taken and the conclusion arrived at was that the project of M. de Lesseps of connecting the Mediterranean with this part of Africa by canal was impossible.

The Egyptian Geographical Society under the presidency of Dr.



G. Schweinfurth, the distinguished African explorer, was established this year at Cairo, through the liberality of the Khedive, consisting of 300 members with an annual income of \$7,000. A substantial portion of this income is granted by the government in view of the advantages to the nation of the labors of the Geographical Society, as is the case with several of the leading geographical societies of Europe. But it would be hard to convince our government of the utility of aiding, by pecuniary means, our Society, the only one in this country, when it would not even incur the expense of sending a commissioner to the late great Geographical Congress at Paris, and to our shame we were the only civilized nation that was unrepresented in the exposition. It is not complimentary to our intelligence and our cosmopolitan relations to the world, of which we form so important a part, that we have a government that takes no interest in the advance of civilization and of the trade, commerce and industry of the world at large, through geographical exploration and discovery, the means by which it has been chiefly advanced from the dawn of civilization to the present time. It was not the fault of this Society that our country was not represented in the exposition for earnest efforts were made by us as well as by the French minister, but were met by the reply that the congress in Paris was the affair of a private society, which was not the view taken by the other civilized nations who made liberal grants of money for the success of an undertaking in which the whole world was interested. With our limited means all that we could do was to send a delegation, as nothing could be received for exhibition except under the charge of a commissioner of the government of the country from which it was sent. If the gentlemen charged with the administration of our government had read the frequent expressions of surprise that I have read in the various accounts written of the exposition, at the absence of any representation from the United States, they would not, I think, be very much impressed with the wisdom and policy of the exceptional position in which they placed our country and people. This was not a case in which we could afford to be indifferent as we do not constitute the whole world.

## AUSTRALASIA.

Mr. John Forrest, with a party, made a journey across the western interior of Australia, from Murchison river to Peak telegraph station, which was accomplished after terrible hardships from the want of water and the barren state of the country. The journey, which occu-

pied six months, was little else than a continued exploration of sand hills covered scantily with the spinifex grass, with very little water, showing that no settlement will probably ever extend in that direction. The region is occupied by savages who were numerous in certain parts where game exists. This was the first journey made through that part of the Australian continent. Sir George Bowen, Governor of Queensland, who was present at the reading of Mr. Forrest's paper before the Royal Geographical Society, gave an interesting account of the progress in Queensland. He said that it was at first declared to be too hot for sheep, and yet now there were 11,000,000 of sheep in the colony. That the flow of pastoral occupation had gone on like the flow of the tide; each year some 200 miles were added to the domain of civilization, and in the course of five or six years pastoral occupation had spread over the whole of a territory which is three times the size of the French empire. Such, he said, were the triumphs of peaceful progress. Indeed, the progress and settlement of Australia is one of the marvels of our time.

Mr. Lewis has explored the country between  $25^{\circ} 35'$  and  $18^{\circ} 35'$  S. lat., and  $135^{\circ} 50'$  and  $139^{\circ} 30'$  E. long., and Mr. Ernest Giles has been exploring the country north of Fowler's Bay.

N. P. Pelletier, who, when twelve years of age was left by some shipwrecked sailors on Night Island, off the north-east corner of Queensland, lived for seventeen years there among the savages, and became identified with them in every respect. He has gradually recovered the use of his mother tongue, though he still retains marked characteristics of savage life. He has given much information regarding these savages, whose language seems to have nothing in connection with the Malayan or Papuan dialects.

#### NEW GUINEA.

I have frequently referred to the long-continued researches in Papua and the adjoining islands, of Beccari the Italian naturalist and traveller. When I last referred to him he was at Kendari exploring a nearly untrodden corner of Celebes. The coast of the island is dangerous on account of the pirates that infest it, who are cruel and formidable, and it is therefore almost without inhabitants. The fear of falling into their hands caused him to abandon all researches in that vicinity, and when last heard from he was exploring the islands and coasts of north-western New Guinea. He had explored Geelvink Bay, had rectified its coast line as delineated on the best maps and

found that it is not so deep as represented on the maps. He has also discovered a river running from east to west for 215 miles from the Arfak Mountains to the east coast of Galewo Straits, and which drains the north-western peninsula of New Guinea. A large river has also been discovered on the north-east coast of New Guinea. It was ascended by Messrs. McFarland and Stone in the London missionary steamer, the *Ellangowan*, for sixty miles, but is believed to be navigable for 100 miles. It has been called *Baxter river*. M. Maclay fitted out the vessel at his own expense for the exploration also of this part of New Guinea. He ascended the *Baxter*, which, he says, is a magnificent river, but the expedition came suddenly to an end from a disagreement between him and the captain of the vessel. As the *Ellangowan* ascended the river in the first expedition, the explorers shot at a wonderful bird of so large a size that the flapping of its wings made a noise resembling the sound of a locomotive pulling a heavy train. They were told by the natives that this ærial monster could fly away with a kangaroo or a turtle, the existence of which bird is confirmed, having been afterwards seen by M. Maclay.

*Baxter river* has been named after Miss Baxter, of Dundee, who gave the steamer *Ellangowan* to the London Missionary Society for the exploration of the south coast of New Guinea. To the liberality of this maiden lady, the world will be indebted for an extensive exploration of this island, which, as far as can be ascertained, is one of extraordinary fertility. It is to be hoped that other women of fortune will, in spreading civilization and religion over unknown and fertile regions of the globe, imitate the example of this intelligent lady, who will not only find her reward in the utility of her noble work, but will be remembered in this great river, which, to adopt a line from Scott, will

“Roll murmuring, with her name forever.”

#### SUMATRA.

The Dutch Geographical Society of Amsterdam are maturing an expedition, to be supported by private subscriptions, for the exploration of Sumatra. It is to be directed to the Djambi territory, a part of Sumatra which is at present but little more than a blank upon the map.

#### FIJI ISLANDS.

The natives of the Fiji Islands have been greatly decimated by the measles brought to the islands by an English vessel of war. The

disease spread over the larger and smaller islands with frightful rapidity, and has carried off whole tribes. The population of the islands was recently estimated at 70,000 natives and 1,200 whites, and the material condition of the colony, now that the islands are conceded to the British government, is full of promise for the future.

#### CONCLUSION.

In conclusion, after this resumé of what has been done in a single year, I think we may feel the assurance that this work will go steadily on until, so far as it is in the power of man, every part of the earth's surface will be explored. The reasons for ascertaining what is unknown respecting the globe, are the same as they were in the time of Columbus. They are not now as then dependent upon the will of sovereigns, but upon an enlightened public opinion which stimulates individuals and acts upon nations; and, in my judgment, will continue to act until the parts of the earth which are now the domain of the savage, or shut off by the ignorance, the fanaticism or the policy of rulers, will be opened up to commerce, civilization and religion.

# THE GEOGRAPHICAL DISTRIBUTION OF FISH IN THE UNITED STATES.

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By ROBERT B. ROOSEVELT,  
United States Commissioner of Fisheries.

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In speaking of the geographical distribution of fish throughout the United States, it will be necessary for me to explain somewhat their habits and manner of propagation. The influences which determine their localization are not difficult to be understood, and are attributable to their surroundings as applied to their specific characteristics. Fish requiring certain conditions of water, temperature and food are found, and can only be found where those requisites exist. The botanist can predict the character of the flora of any region of country when informed of the nature of its soil and of its climate. He knows that it is useless to look for the hard woods and the gorgeous flowers of the tropics under the cold skies of the far north. He can trace from the extreme limit of human exploration towards the Pole the gradual change of the productions of the earth, through the moderate climes of the temperate zones to the torrid heats of the equatorial region. Every degree of latitude marks some small difference in an arrangement which cannot be altered except by moving the poles of the planet, or by bringing to the fervid South the perennial snows of the frozen Arctics.

So the student of ichthyology—ichthyology in its broader scope, as understood by modern inquiries to be an investigation of the habits of fish and not their mere classification into arbitrary divisions—can determine, when he learns the peculiarities of the waters of any section of country, what fish will be found in them. The spruce tree of the North cannot exist at the South. The palm, the date, the mahogany of the South would perish under the first snow storm of the North.

In like manner the salmon and trout which delight in the freezing limpid mountain brook, made up of springs bursting at every turn from the hillsides, would die instantly if transported to the over-heated waters of some sluggish Southern stream. The nature of the fish is controlled by the nature of the element in which they live and can-

not be changed to suit other and unnatural conditions. Yet so little thought has been given to this subject that a simple proposition like this is often not known to those who desire to undertake the artificial cultivation of fish, and discouraging failures are continually reported in attempts at fish culture where a few moments of intelligent investigation would have demonstrated the impossibility of success. A consideration of the marked traits of each variety of fish is, therefore, necessary in discussing the area of territory throughout which it is distributed. By proceeding in this way we shall learn not merely where it is found but why it is found there.

The special fish of the New England States is the salmon, the true salmon, *salmo salor* of Europe, and not the California salmon, or *salmo gairdneri* of the Pacific coast.

I shall confine my remarks to our own country, not even crossing the border into the neighbor land of Canada unless by way of illustration now and then.

Salmon were never found West and South of the Connecticut river. A few may perhaps have lived in the small adjacent streams, and a straggler may, occasionally, have lost his way and wandered into the Hudson, or even gone as far astray as the Delaware, but, as a body, they did not exist in New York or any State to the South of it. It has been a tradition, on the authority of Hendrick Hudson, that "great stores of salmon" once inhabited our famous river, but it is now conceded that he must either have referred to shad or weakfish, probably the latter, both of which enter the harbor at certain seasons in large shoals. Even to this day the weakfish is miscalled in parts of the country after his nobler brethren in Pennsylvania, becoming a "Susquehanna salmon," and in Florida a "salt-water trout."

All the important rivers of New England were once filled with salmon. This would be the case still were it not for dams and obstructions which prevent their performing the necessary functions of procreation. The inordinate fishing of New Englanders, who seem to be gifted with special skill in discovering murderous methods of destroying the wild inhabitants of our forests, field and waters, would not wholly have prevailed against them, had not their habits been interfered with and their liberties annihilated.

Salmon are anadromous. They pass most of their time in the sea, to which they have an irresistible impulse to descend if they can possibly do so as soon as they attain the proper age; but they must ascend into cool, clear water to deposit their eggs. It would be

impossible, in the short time which I can command from your attention, to enter into all the particulars of their method of propagation, but as the eggs have been hatched by man from the moment of their extrusion to their change into that of young salmon, all the necessary conditions for their perfect development are fully known. Two requisites, however, may be mentioned, first, purity of water, secondly, a cold temperature. A glance at the map will show how admirably the rivers of New England furnish these essentials. They all rise amid the mountain tops of Maine, New Hampshire or Vermont. Pellucid and cold as the springs in which they have their source, those springs often segregated into ponds or lakes which are in fact but larger springs, they pour down to the South and Southeast, with few falls but many rapids, till they reach the sea. In the upper waters salmon find all the requisites for laying and hatching their eggs and continuing their species. At the outlet lies nature's storehouse, the ocean, from which they draw unlimited rations. The passage from one place to the other was not difficult nor tedious.

Of course, salmon were found where nature had so accommodated itself to their habits, and they existed in no limited numbers. The rivers swarmed with them; from them was furnished a large portion of the food of the inhabitants; fresh, salted or pickled they were a national resource of vast magnitude and value. Millions of dollars yearly would not represent the extent of their commercial value had their abundance not been diminished. They cost nothing; they fed themselves, they required no tillage, no manure, no care. They looked after their own affairs. From the worthless productions of the sea, shrimp and snails and minnows, they drew their support. When they were large enough for the table, they left their distant haunts and came into man's jurisdiction. They crowded up to his home, to his very door and waited only to be taken out and converted to his use. So magnificent and generous a heritage should have been guarded with care, but the inhabitants thought otherwise. Instead of protecting and developing it, they destroyed it. Impassable dams were erected across these rivers, the conditions were changed and salmon disappeared almost as though they had never been.

I have said that the eggs would only hatch where the water was cold and limpid. The fish, even, will perish when the temperature of the latter rises too high. Here are conditions which are obligatory: If the eggs are deposited in warm, muddy or brackish water, none of them will ever hatch. It is not a question of a per centage

of loss, but all perish; not a single egg will develop. The dams erected on the rivers of New England forced the salmon to spawn their eggs in the warm, foul and sluggish water — if they spawned at all — and the consequence to-day is that not a single salmon is taken in the Connecticut nor in any Eastern river across which has been thrown an impassable dam.

Trout are found in all rivers in which salmon can hatch their young; but as they are not necessarily migratory, they often dwell where salmon cannot. Trout require a temperature of water never exceeding 70°. At 65° they begin to suffer; at 70°, unless there is a strong and broken current to give life to the water, they die rapidly, and not one will survive a temperature of 75°. It is simply manifest, then, that the Southern and Western rivers are not inhabitable for trout or salmon. Trout may be found in the head-waters of such as rise in the Alleghany range of mountains, but salmon can exist in none of them. So, also, with the sluggish, muddy rivers of Ohio, Indiana, Illinois, Missouri and the vast central region of our continent. Throughout the entire section between the Alleghanies and Lake Superior and the Northern Mississippi, no trout are found; and then, again, not till you come to the Rocky Mountains. Trout and salmon, except in the matter of migration, are similar in their habits. The eggs of either may be hatched in the same boxes with the same water, in the same time and under the same treatment. This is being done to-day by the New York Commissioners of Fisheries at the State hatching-house at Caledonia. There are trout (*salmo fontinalis*), salmon (*salmo salar*), and lake trout (*salmo conifinis*), all being hatched side by side in the same building, in identical troughs and with the same water.

In lieu of the salmon the special migratory fish of the lower Atlantic States is the shad. Shad also visit the New England rivers for the reason that they can time their appearance to the proper temperature of the water, and during the warm weather the latter is sufficiently high. Their eggs hatch best in a temperature of from 65° to 75°, 80° being the extreme limit. This is 20° higher than for trout. In February shad make their appearance in the rivers of Florida, gradually showing themselves to the northward as the spring advances. In May they are in Virginia, in June in New York, and in July further North. The fish culturist may follow them along and hatch them in every river. They do not ascend to the extreme sources of the streams they visit, contenting themselves with stopping



here and there above the salt or brackish water, and depositing their eggs in any convenient and appropriate locality. They are much more prolific than the *salmondiæ*, their eggs hatch in one-tenth the time and they are far more easily and cheaply handled. Their care and protection is a matter of national interest. No fish is so easily multiplied, none has been previously so abundant in our country, and none is so truly the food of the people.

Salmon trout, which are sold at from half a dollar to a dollar a pound in our market, are the delicacy of the rich. Circumstances will prevent their ever being very abundant with us, but shad are the property of the poor; they are still moderately cheap, being made so by the efforts of the Commissioners of Fisheries of the Middle and Eastern States, and their numbers can be augmented indefinitely. A few years ago contracts were made for the wholesale delivery of shad for eighteen dollars a hundred. This price would have advanced with each succeeding season. Fisheries were ceasing to pay expenses even at that extravagant price. Their proprietors were giving up the business and selling their nets. The utter annihilation of this species of fish was rapidly approaching, and was only prevented by the vigorous efforts of the Fish Commissioners. Millions of shad were hatched in the Hudson, Connecticut and other rivers; their numbers rapidly increased, the price fell, the yield of the Connecticut became larger than it had been for half a century and shad were sold last year on the upper Hudson for three dollars a hundred.

Having thus treated of the distribution of the fish of the sea-board, let us glance at those of the interior States. The national fish of America is the black bass. Wholly unknown in European countries, it exists solely with us, where its vigor, enterprise, restlessness and independence, its athletic, but not altogether comely appearance, make it rather representative in its character. It is self-reliant, and when placed in new waters not merely makes itself at home, but appropriates the locality, explores its furthest recesses and devours its aboriginal inhabitants. Its natural distribution was through a few of the lakes of New York, but mainly in the North-Western States. It has, however, been acclimated in many other ponds and lakes, where it now flourishes extensively. A younger brother, the Oswego or grass bass is more common, and being less particular in its choice of habitation fills, often in countless numbers, the muddy and weedy ponds and streams which the true black bass disdains. These fish, together with the pike-perch *luciperca*, a variety of which is called the Ohio salmon, people

the waters of our land from New York to the Rocky Mountains, and exist here and there also, in some of the streams of the Southern Atlantic States. They have certain marked differences of habit, the black bass loves bright, pure, lively water, not as cold as the trout streams of our spring-producing hills and mountains, but free from foul matters held suspended in it and with motion either of current or from the winds. It deposits its eggs on rocky or pebbly ledges. The pike-perch lives in the great Lakes and rarely, as in the case of the smaller specimen, the Ohio salmon, remains even in the larger rivers, while the grass-bass loves muddy, weedy shores along which it lays its eggs.

None of these varieties are susceptible of artificial cultivation. The eggs, when they exude from the parent, are enveloped in a gelatinous or mucous substance which seems to be necessary to their protection. They seem to require to be in a large expanse of water with possibly gradual and gentle change, but must not be exposed to a strong current. If they are confined within a narrow space there is not sufficient oxygen in the water, and they die for want of vitalization. A few have been hatched by way of experiment, but the care required was too great for the advantage obtained. It is fortunate in this view of the case that black bass are gifted by nature with a peculiar instinct, they guard and protect their nests till the young are hatched, and even watch over the latter till they can take care of themselves. Alternately the male and female stands guard over their precious possession of infantile possibilities; if one is away scouring the country for food, the other is on the watch, fierce, brave, resolute, and woe to the unhappy intruder who would steal a dinner from the deposit of bass eggs. The bass is the tyrant of the fresh waters, even the big-jawed, snake-like pickerel cannot stand against him. His teeth are long and sharp, his mouth is large and threatening, his body is close-knit and stout, and his fins are arrowed at every point with sharp and poisonous spines. Such a creature, mounting guard over his young, is not an enemy to be despised.

Moreover, this class of fish have a comparatively low range of vital action, they can resist exposure, removal from their natural element and transportation better than trout, salmon or shad. Advantage has been taken of this characteristic to acclimatize them in waters which had previously been occupied by inferior fish. Black bass have been distributed through hundreds of ponds in New England and New York, and the Oswego bass has literally crowded the Potomac river, in which it was placed in 1859. Their natural increase is very

rapid, and of the three different species one or the other is suited to almost all the streams of the lower and more level portions of our entire country.

West of the valley of the Mississippi and the great plains, among the fastnesses of the Rocky Mountains and on their western slope we again find trout and salmon. Not, however, the eastern trout, *salmo fontinalis*, or the northern salmon, *salmo salor*, but several species of large spotted trout and a new salmon called the *salmo gwinuat*. Many years ago, before gold was discovered on the western coast and even, I believe, before California came within the galaxy of American States, an English admiral, stationed in the harbor of San Francisco, wrote home an account of the country. His views were not complimentary and were contained in one pithy sentence which, if you will forgive the irreverence, I will repeat. He said: "California is not worth a damn; the salmon will not take a fly." His opinion of the value of the country was notably incorrect, but one can almost forgive the disgust of an ardent fisherman when he discovers that the beloved objects of his sport have proved false to all the traditions and habits which lent them their charm. He had discovered that Pacific salmon were not the true article, and his whole idea of life was clouded in consequence. This discovery of the bluff old naval sportsman has been confirmed by the investigation of fish culturists, and it is now admitted that the California and Oregon salmon is a new variety.

Every thing in that wonderful country seems to be something new and strange. The trees have to grow hundreds of feet high, a waterfall is not noticed unless it falls a thousand feet, silver is not worth digging unless it is found in *bonanzas*, which means "chimneys" or solid columns of pure metal; and pears are thrown away as nubbins unless they are as large as cabbages. Even a quiet, modest, respectable New England pumpkin-seed, when planted in that astonishing country, feels called upon to produce a fruit big enough for an ordinary house in which Peter Piper, or any other man, could keep a wife and raise a family very well. It is not surprising then, that the salmon change their modes of life, despise feathery flies and endure a temperature of water which would be fatal to them in our more methodical land. Some of these have lately been introduced into the rivers of the Atlantic States under the auspices of the United States commissioner of fisheries, and the time may yet come when we shall have salmon in the Hudson, the Delaware, the Susquehanna,

the Potomac and, perhaps, even more southerly rivers. This is but fair. A few years ago we sent shad to California, a fish which had not theretofore existed in the tributaries of the Pacific, and in return California should send us its salmon which promises to do well in rivers that are not habitable by the true salmon of the north.

I have now taken a cursory view of the geographical distribution of fish in our country and given some reasons for this distribution. I could not enter into a more extended review of the wider subject of the artificial increase of the supply. Incidentally, however, something has been shown of what has been done, but far more lies behind. The future promises great results. Not only can fish be raised as easily as vegetables are raised, but with a productiveness ten fold greater. The waters will soon teem with them, and our rivers and lakes will be cultivated precisely as the land is cultivated till they shall support acre for acre as many human beings. Nor is this all; but acclimatization has done much for the tillage of the earth, it will do as much for the tillage of the sea. New breeds of animals have been introduced in countries to whose climate they were specially adapted; care in breeding has raised others to higher development, while vegetables and grasses have been cultivated scientifically and brought into new areas where they flourished luxuriantly. The same will be done with fish. Shad will be taken to the Pacific; salmon will be brought to our own doors; the great trout of Maine, weighing ten pounds apiece, will replace the fingerlings of our brooks, and bass will abound everywhere. The entire science has been left for our day and generation when the thorough exploration of the world and the rapid increase of population make it necessary. We have only to do our duty in order to secure for ourselves and our fellow-men the full benefit of the wonderful discovery.

# PALESTINE.

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By A. L. RAWSON, Esq.

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MR. PRESIDENT, FELLOWS OF THE SOCIETY, LADIES AND GENTLEMEN.—A systematic survey of that part of Palestine lying west of the River Jordan has been carried on for nearly eight years by scientific men in the employ of the English and American Exploration societies, and for a period of one year that part lying east of the Jordan and of the Dead Sea has also been under investigation. The results of these surveys have from time to time been published, in whole or in part, according to the progress of the work. There is much left to be accomplished. There are many who feel great interest in the progress of the work, and who look forward to the desired end with lively expectations of valuable results.

The earliest accounts of Palestine in the Bible are sustained by antiquities found in Egypt, Assyria and elsewhere. Among the most important of those recently discovered are the Moabite stone and the book tiles of Assyria lately deposited in the British Museum by Mr. George Smith. As read by English scholars the story of the tiles sustains the antiquity of the Bible history of the deluge. The authenticity of the Assyrian tablets containing a story of the deluge is undoubted; the exact time when they were written is not yet fixed. From them we learn that there were legends or traditions in Assyria so popular that they were reduced to writing and deposited in the king's palace (or library) where they were found by Mr. Smith.

Possibly the fact of Abraham's visit to Egypt is sustained by monuments directly; incidentally the evidence is strong, although it is claimed by some that any supposed reference to Abraham's sojourn, or even to the servitude of the Hebrews in Egypt, is only a conjecture. There are undoubted records on the walls of Karnak in which occur many names of cities in Palestine, whose kings were captured by the Egyptians in the time when Solomon, King of Israel, was at war with Shishak, King of Egypt.

I spent the summer of 1873 in Syria, a part of the time walking

over the ground surveyed by the American party, and here are portraits of the shekhs who govern the tribes living there, hanging on the wall before you, among others of the most noted characters of that country. There is Shekh Goblan, the best known and worst specimen. The old man is Shekh Ali Diab Adwan, father of Goblan, and a fine old patriarch he is; a worthy representative of our Father Abraham of old, who lived not far from him in Hebron, which is plainly seen from Moab, and who lived as the Diab does, in a tent; and by keeping his flocks, raiding or defending his tribe from raids. This old Shekh is a member of the same secret society that counts your speaker as one, and for that reason showed me many favors unusual to most travelers and refused a baxish, an unheard of touch of generosity in a Bedawin. I was directed to the various camping places of the exploring party and enabled to get a good idea of the time they spent in Moab and their manner of doing the work.

The writings of Josephus are a treasury of information on all matters relating to the country, character and history of the Jews, but Christianity owes him nothing. He probably had the benefit of older accounts now lost. Christian notices of Palestine begin with the Epistles of Paul and are continued by the other writers in the New Testament. The Onomasticon described the most noted places in the Sacred Scriptures in Greek (A. D. 340), which Jerome translated into Latin in A. D. 420, and it reads correctly as applied to many of the places as they are now. There are in it some ridiculous errors which have been perpetuated by many modern travelers who have faithfully imitated them. Arculf traveled and Adomnan wrote about his journey in the seventh century (610). There is, after that time, a blank for 300 years following the invasion of the Persians under Chosroes. The work of William, Bishop of Tyre, was written in the years 1095 to 1184. Dr. Sepp, of Munich, this last year explored the ruins of the Cathedral of Tyre finding many relics of the early ages, among which the most important of all is the supposed remains of the eminent Origen who died and was buried in the Cathedral at Tyre about A. D. 250. The robes of the bishop, his ring and other insignia were found in the tomb with his dust. The tomb of the Emperor Frederick Barbarossa (buried in 1190) was opened also but the body was not there. In the tomb of the wife of this emperor at Spire, Germany, there had been found two skeletons some years before. It is now believed that the bones of Frederick had been transported and laid beside those of his wife by some friend. Benja-

min of Tudela wrote in 1160-1173, and from these last two named are derived many notices of places and persons concerned in the Crusades. The contemporary accounts of the Crusades or of the country are few. We have, in Arabic, the works of Edrisi of Africa, author of a "Treatise on Geography," and a silver terrestrial globe in 1154, and of Abulfeda of Damascus, whose "Description of the Countries" is the best work on ancient geography of the age. Twenty years ago there was a work in manuscript, in the Convent of Mar Saba, giving an account of the Crusades from the Greek side of the story down to the time of the occupation of Jerusalem by Saladin, 1187, with a continuation in Arabic from Saladin to Suliman, who built the present wall of the city in 1542. The book is now in Athens, and if it could be translated into English would probably give an interesting history from a new standpoint of those religious wars for the possession of the sepulchre. All our present information is from a Latin source. Sandys, a classical traveler, visited Palestine in 1611, and his accounts and pictures of places and of costumes are but very little different from what would be correct of the same subject now. Sir John Maundeville traveled in 1327-1360, visiting Palestine, Egypt and China, about which he wrote a very reliable book. His extravagances were simply oriental.

Maundrell's visit was in 1697. In 1714, Reland's great work comprised all that was known in his day on Palestine and Syria. Calmet's Dictionary was written in 1707 and was only superseded by Kitto and Smith. This century opened a flood of information on the East, beginning with Seetzen, Burckhardt (1812); Irby and Mangles (1817), and most notably the works of Dr. Edward Robinson of New York who, assisted by Dr. Eli Smith who was familiar with Arabic, made two journeys through Palestine for materials which are still the basis of every considerable book on that country. Until 1837, when he visited the East, there had been no systematic survey of the lands of the Bible. Thousands of travelers had, it is true, skimmed the surface, taken their crude, disconnected notes and published sketchy, unsatisfactory volumes, but none had "spied out the land" to show its accordance with the Word of God. Dr. Robinson was scarcely three months in Palestine. He had neither time nor means for examination. The tape-line and pocket compass were his only apparatus, yet so thoroughly had he learned the history of the Bible and the wants of Bible students that to this day every page in the Scriptures is enlightened by his labors. Rabbi Schwartz wrote a book on Pal-

estine, in Hebrew, in 1850, which gives many identifications of sites derived from the Hebrew language as understood by him, and some of them have been adopted by other scholars. De Saulcy traveled a little and wrote much in 1853. In 1847, Lieut. Lynch, U. S. N. (afterwards a commodore), conducted the first scientific expedition in Syria of modern times, which surveyed the valley of the Jordan and the Dead Sea, the great result being the determination of its depression (1,312–1,327 feet). Dean Stanley's work was written in 1853, and besides several of his own identifications of biblical sites he reasons well on the observations of others. Tobler's work (in German) is a compilation from nearly every other extant, with additions by himself. Lieut. Van de Velde of the Dutch Navy made two journeys through parts of Palestine, in 1854 and 1865, and constructed a very large and comprehensive map with a great deal of correct information and a few unavoidable errors and conjectures, chiefly in the sections not visited by him. Wetzstein made a book full of valuable matter on the Hauran, borrowing his map from that of Mr. Porter's, published in 1858 in Murray's *Hand-book*. Ritter wrote six volumes, in German, on Palestine in 1850. One of the most valuable of the recent works on Syria is that of Rev. W. H. Thomson, "The Land and the Book," containing the results of his experience as a missionary, traveler and observer during twenty-five years. The only book equal to it is that of E. W. Lane on Egypt, and that is an unrivaled work. Such a work is wanted on Syria and Palestine, and is the only new thing possible on that subject, as it seems at present, except discoveries of antiquities and identification of sites still unknown and mentioned in the Scriptures.

The maps of Palestine, so far, have been the work of Germans and Americans, and, also, some of the most important archæological discoveries have been made by such men as Dr. Robinson, Dr. Barclay, Lieut. Lynch, Dr. Van Dyke, Dr. W. H. Thomson, and some small addition by myself. My work on Palestine began in 1851, as an assistant to Dr. Robinson in a part of his journey and work, and since that time I have been almost constantly employed among the publishers of books and maps illustrating works having a direct reference to Palestine and the East, the lands of the Bible and the great classics, Greek and Latin, and works of modern travel. This has required me to give some years of my time in residence and travel among the Bedawins and Arabs who live about the places I was commissioned to sketch.



Of recent explorations the English Palestine Exploration Fund has taken the lead in importance. The survey for an accurate map of nearly three-quarters of the country West of the Jordan has been made on a large scale (an inch to the mile), and many sites have been identified and some errors corrected, while expectations of the discovery of antiquities have been almost entirely disappointed. The work will be carried on for three or four years longer until the map is completed on this side of the Jordan.

The English party has lost in Mr. C. T. Drake, who died while I was in Jerusalem last June, their most learned archæologist. He gave himself up to the work and was a ripe scholar in oriental tongues and lore. They have, as yet, found no one to succeed him.

It was Mr. Drake who accompanied Mr. Palmer in the Wilderness of Tyh, and Captain Burton in the newly-discovered region West of Damascus describing and sketching with superior ability both as an author and artist. At his funeral (so favorably was he known) there were present men and women of ten nationalities and of as many creeds in religion. The entire survey in all its branches from the first field work, when he assisted in running the base line, down to the day of his death when he made known his discovery of the first inscription found at Gezer, has been assisted by his sterling good sense, classical education and devotion to the work.

The exploration and map on the East of the Jordan was left to be made by the American branch of that Society, known here as the Palestine Exploration Society, Rev. Roswell D. Hitchcock, D. D., president. This Society has had a corps of engineers and archæologists in the field a year, working in the district around Heshbon, the results of which are a preliminary map by Lieut. Steever of a part of Moab from Wady Zerka Ma'in to Heshbon, and some identifications by Prof. Paine, the most interesting of which is that of Mount Pisgah. The Society's third report, by Prof. Paine, will give the particulars of this matter, illustrated with a sketch map and picture and is promised in a few days. Besides this Prof. Paine has nearly ready a report on the Botany of Moab, in which it is expected, from an examination of the specimens of plants and flowers brought home by him, that he will bring to our notice several varieties of flowering plants heretofore unknown. The materials for exhibiting its geological features have been gathered on different tours in Palestine by the speaker, and are now in New York. The work before the Society will consume two years longer, after which the survey for the map East of the Jordan

will be completed. The archæology of Palestine will require a company of ten skilled men twenty years. We have as yet only touched the surface. The work of Capt. Warren at Jerusalem was but a beginning. It determined only a few points. The great map of the topography of the Holy City has yet to be made and judging from the past it will have to be done by Americans.

The expedition for the second year is still unable to move from New York for want of funds, although its employees have been in its pay since October last, the managers having decided not to send it off before enough money is in the treasury to insure against all expenses for at least one year, if not two, in advance.

There are two other societies in this country engaged in the work of diffusing a knowledge of the Holy Land, both of which date anterior to the Palestine Exploration Society. "The Scholars' Holy Land Exploration" was organized in 1868 and after bringing from Palestine nearly fifty tons of stones, wood, flowers, seeds, and other objects gathered from certain noted localities and distributing them to its subscribers in small packages, that society merged into "The American Holy Land Exploration Society," which is still in active operation and besides having sent out two expeditions, is keeping an agent in Palestine. Its secretary is Robert Morris, LL. D. The first president was Samuel Hallock, Esq., electrotyper to the American Mission, Beyrout, Syria. Hon. E. T. Rogers, then H. B. M.'s Consul at Damascus, now of Cairo, Egypt, was the first vice-president.

"This society is formed" so reads the original prospectus, "to develop the Geography, Geology, Natural History, Archæology, Manners, Customs, etc., of Bible Lands," and the work was thus particularized:

*First.* To explore the Lands of the Bible in the interests of religious instruction.

*Second.* To publish in books, magazines and the general press the results of our traveling researches and the correspondence of our resident directors in Egypt, Palestine, Syria and Asia Minor.

*Third.* To furnish information through skilled and pious lecturers upon all subjects wherein the lands of Holy Scripture sustain the accuracy of the Book.

*Fourth.* To collect, collate, identify, describe and distribute all manner of objects found in Biblical countries that throw any, even the slightest rays of light upon "the mind of the Spirit" as opened out in the Divine Narrative.

Another society is doing a distinct branch of this work of familiarizing Christians with the lands of the Bible, by the means of pictures and maps. This is "The Oriental Topographical Corps" Rev. J. T. Duryea, president, Rev. E. P. Ingersoll, secretary, Rev. James Strong, S. T. D., president of the archaeological council, and George May Powell, business manager. The topographical work has been carried on in Palestine by three expeditions in different years, and photographs have been made of several hundred localities. Sketches in colors, have been made of almost every historical site on both sides of the Jordan and the Dead Sea, in the Siniatic Peninsula, among the sites of the "Seven Churches" in Asia Minor, in Cyprus, Crete, and the Greek Islands, by your speaker for the same object. A new system of combining pictures with maps is in use by this "Corps" which greatly facilitates the study of the topography of the country. Its map work as proposed will cost less than a quarter of the money necessary for the completion of the English and American surveys.

My map may be called the pioneer in this enterprise and the edition published by me in Boston in 1856, showed nearly every historical site belonging to Palestine mentioned in the Bible, from actual survey when known, and from conjecture where no survey has been made. A high compliment was paid to this map by compilers of the late works in Europe, in copying its matter including even its errors, most notably of places on the East of the Jordan.

Very few additions have been made to this map as published by H. H. Lloyd in the edition of 1868, which has lately been somewhat improved and re-issued for the "Daily Witness" of this city.

It will be noticed that several of the places mentioned by Prof. Paine, of the Palestine exploration, as having been recently identified by him in the regions East of the Jordan were located conjecturally by me in the same places from examinations of the sites made by me in 1851 and 1853. The site of Pisgah has in reality never been lost, having been correctly reported to every traveler who has taken the time to visit the place in company with a Bedawin who was familiar with the region. I sketched the Springs of Moses near the foot of Mount Pisgah in 1852, and again in 1874, an engraving of which is printed on the cover of the Third Statement of the American Palestine Exploration Society, drawn by me for that use. A sketch of Moses standing on Mount Pisgah was published by me on a map in Boston, 1856; and a view from Pisgah was engraved from a painting made by me for Scribner & Co., in 1870, and published in "The

Sacred Heroes and Martyrs," by Rev. J. T. Headley. A similar view was engraved and published by H. H. Lloyd & Co. on the top of their map of Palestine, edited by me in 1868. Careful descriptions of the "Hill Pisgah" (following the Hebrew text) have been published in several Bible dictionaries edited by me, and published in this city and Philadelphia, and yet we read the surprising statements in the Report of the American Palestine Exploration Society, on page 1, concerning the "long lost Pisgah." There is also a volume on the "Recovery of Jerusalem," which city has not as yet been lost to human vision, nor have a sufficient number of antiquities been "recovered," with which to reconstruct the ancient city. This has probably resulted from the errors before mentioned, and also the unscientific ways of carrying on the work, all of which should be corrected or avoided in the future. The experience already gained has been expensive in both time and money, but will be none the less valuable if it be utilized in the future. Those who have risked their lives there, and learned how to endure the climate and the natives are certainly more capable than new men.

All this comes of attempting to do engineering and archæological work with untrained men. As soon as the "Society" can gather enough money they will repeat their original error, and send to Palestine another corps of men unacquainted with the country, its climate, history, traditions, language or manners.

One of the conjectured locations made by me on the West side is Gezer, near Ramleh, now the residence of the Jerusalem banker, M. Berghem. It was there that Mr. Drake found an ancient inscription and Mr. Ganneau discovered another, in what is supposed to be early Hebrew or Phœnician characters, and read as indicating the limits of Gezer. They may be found on a better acquaintance to be the landmarks of the Philistine city, for it was only in the time of Solomon that Gezer became subject to the Hebrews through a gift of the Pharaoh as a dower for his daughter, wife to the King of Israel, and the inscriptions are supposed to belong to an age anterior to Solomon's, if not, as early as that of Joshua. If this supposition proves to be true the inscriptions will be among the most ancient monuments in Palestine.

There are some points that can never be settled beyond a mere conjecture, such as the site of the Holy Sepulchre, Calvary, the grave of Moses, of the cities of Sodom and Gomorrah. And these are essential for nothing save curiosity. Their position settles no question

one way or another. One thing seems likely to be determined by a better acquaintance with the geology of Palestine, and that is, that the valley of the Jordan and the Dead Sea have not been depressed since the historic period, and it certainly was not in Abraham's time. A more important point is settled, that there is now no doubt that the writers of the books of the Bible were minutely acquainted with the country in which they lived and wrote, as an instance will illustrate. They spoke of going up to Adummim from Jericho. The present road ascends all the way from Jericho to the Khan el Achmar (Red Inn), the half-way house. The guard house on the hill above the ruins can be seen from nearly every mile of the way up. So, also, the new chapel built by the Russians on the east side of Olivet can be seen from the Jordan valley, and here and there all the way *up* to Jerusalem. Thousands of such confirmations of the truth of the Bible text could be given. The extent of the country, including the points of greatest interest, is limited, From Kerak to Sidon is 150 miles, as the Hebrew reckoned; from Dan to Beersheba it is about the same distance, north and south. From Joppa to Es Salt—the ancient Ramoth Gilead—it is sixty miles; the desert begins a few miles East of Es Salt. From Acre to Salcah in the Hauran is 110 miles. This region contains about 15,000 square miles, and as a country to be surveyed is singularly small when we consider its importance. To Christians its interesting points are beyond those of all other lands, because it is the land in which the most thrilling and sacred records of the Gospel are centered. Every detail of its history, geography and archæology must and will be made familiar to every believer in Christianity. The expense of this work, so far, has been very great, and from the nature of the country and its climate, and the character of the people, the actual cost of the surveys must be far greater in proportion than similar work in other countries. The United States Survey, under Prof. Hayden, this last year covered a larger territory than Palestine, and thoroughly so, and for less money than the English party has cost in any one year in its survey of a district less than one-fourth the size of that done by Prof. Hayden's. A similar practical business capacity applied to the survey East of the Jordan river in Palestine will do the work in a reasonably short time; do it well, and at a moderate cost. The English survey and exploration so far has cost \$225,000, and will require \$150,000 for its completion. The American survey has cost about \$15,000, and will require from \$20,000 to \$35,000 more for

two years' work, which is the estimated time for its completion. If the sincere, earnest members of the church in the United States ever find out that this survey is going forward there will be no lack of funds. Ten cents from each one of them would be more than enough money for the expenses. And this leads me to call attention to one or two weak points in the management of the business of the survey. It has been pointed out to me as an error in the management in having sent out young men on high salaries who were unacquainted with the country, climate, language, manners and customs, when older men, having the requisite experience could have been had even at a less cost in money. There is no better man in this country or in Palestine for the work than the son of the Rev. Dr. Van Dyke in Beirut, whose knowledge of the Arabic and other oriental languages in Syria is almost equal to that of the most educated native. He has been engaged for future work.

The Committee charged with the executive work have left the main share of it in the hands of the Rev. O. S. St. John, the secretary and collector, whose activity is almost marvelous, and only equaled by his tact and good sense. But one man, however capable, can hardly manage the affairs of a society where, besides a peculiar fitness and large amount of knowledge on the subject, the work requires more than the entire time of one man. The present engineer-in-chief, who succeeds Lient. Steever, U. S. A., is Col. J. C. Lane (in active service in the U. S. V., three years in the field during the late war, and chief engineer on a Ship Canal Survey in Central America), is said, by competent authorities, to be in every way qualified for the work. His assistants will be the best that it is possible to have, and the cause is so far popular that at least twenty men have offered to go without pay beyond their expenses, so there is no lack of numbers from which to select. The management have therefore avoided repeating their first mistake, so far as the engineer is concerned. In the matter of archæology other questions will arise. One thing is certain, an oriental archæologist cannot be made at a moment's notice. And this leads me to say that one other error is persisted in even now, by the management, and that is in ignoring the work, or discoveries of any one who is not connected with the surveying party in the employ of the society. Valuable results, whether produced by the society or by individuals, are welcome, and jealousy on the part of new workers in the field will hardly improve their standing before the public as compared with older servants in the cause. The paper

of Prof. Paine, the archæologist of the American party, on his identification of Mount Pisgah, will bring some of the results of the survey to the notice of the members of the Palestine Exploration Society, and so far show the value of the work done. The discussions that are quite likely to arise on some points advanced in that paper will quicken the interest of every one concerned in Eastern exploration. If time permitted, it would be a pleasant task to show why there is no other country that offers equal attractions to one who loves to investigate the past as this Palestine, but a glance at one or two items must suffice at this late hour. There is a wonderful fixity of local tradition everywhere in the land. The people come and go; even nationalities change, but the traditions remain and are repeated by father, son and neighbor to neighbor, as we might say world without end. Some of these, by frequent repetition and change from one language to another, have been reduced to childish stories or popular legends. These, when carefully examined, throw light on the Bible narratives.

A tradition relating to Adam and Eve has some points not before explained so clearly as therein. Adam grieved over the death of Abel, and looked downward, never lifting his eyes even at the face of his wife Eve. So God pitied his case, and as a consolation sent the Angel Gabriel, who taught him how to make and eat bread from wheat. At the first the kernels were as large as ostrich eggs. After the deluge they shrank to the size of goose eggs, and in the days of Solomon they were no larger than grapes. The present size, but little larger than mustard seed, is probably owing to the domination of the Turks, who cast a blight on man, beast, and vegetation everywhere they go. Adam taught his wife Eve the art of making bread, and since then women have turned the mill and heated the oven in every true believer's house. It is practically impossible to give an audience an idea of oriental music without the music itself in illustration. The basis seems to us to be rythmical noise, tone without harmony. Yet the effect is exhilarating, exciting the passions, and is so far adapted to the oriental character. The piano is the most welcome of all our instruments in the East. We read in the First Book of Samuel, in the sixteenth chapter, in the sixteenth verse, that Saul commanded his servants to "seek out a man who is a cunning player on the harp," and there is a story told by Bedawins which will illustrate that passage. A Pasha of Damascus on his way from the Holy City of Mecca, where he had performed the great circuits of

the Kaaba, amused himself and his friends by songs, stories or whatever could be found for entertainment in the caravan. Three musicians were summoned before him and promised a reward each according to his skill; to one a fine donkey on which to ride when weary, to the second a horse, and the third, the best, a camel, a swift dromedary, with a canopy. They were to perform before the Pasha on separate evenings, after dinner. The first amused the Pasha and the company so much that they roared with laughter and rolled over on their carpets with ecstasy. The second so enlisted the sympathies of the company in a pathetic tale that they wept in concert over the woes of the heroine. The third performer enchanted his audience with his mellifluous harmonies, smoothly flowing rhymes, in which charming medium he conveyed dreamily a simple tale of a pair of youthful lovers, with many allusions to quiet retreats in bowers of roses near a dripping fountain. Languidly floated his own happy spirit, forgetful of the cares of life, pleased with a trifle, and contented in repose. He carefully studied the faces of his audience, and as they assumed attitudes denoting ease and content, his music sank into low murmurings, and as they dropped off one by one into sleep he softly strummed a few bars of low bass notes in harmony with the general snoring around him. The last of the three musicians was rewarded with the camel, as the most valuable present, for, said the Pasha, although one may make you laugh, and another cause you to weep, still you cannot forget, neither while laughing or weeping, your own or another's misfortunes, and he who is skillful enough to bring forgetfulness and repose gives you peace and rest in a sweet elysium, the reward of true believers.

It will be seen by a reference to the text just quoted, that David was successful in chasing away the demons of unpleasant recollections from Saul's brain by his music, excepting only when the king became jealous of the musician himself, and then the performance had the contrary effect.

Music is said to have been the invention of the Persians, from whom also we have derived our musical instruments. The prejudice which has obtained in some quarters against the study of the Arabic and Persian languages having been dissipated in part, their usefulness in illustration of Scripture is being acknowledged. The intimate connection of the Jews with the Persians during many centuries of their history leads us to expect much light from the Persian language in elucidating the books written under such combined influence.



Such a help is needed in tracing obscure references to ancient history, mythology and manners.

When the Moabite pottery, with its inscriptions in perhaps the most ancient Hebrew dialect, shall be thoroughly known and interpreted, we shall probably have many illustrations of obscure passages in the Old Testament, as several points have already been cleared up, although the readings are as yet somewhat uncertain. The Hamath inscriptions, now utterly indecipherable, must eventually be read, for who knows what priceless story may be treasured up in those strange characters. And so, walking over the country and noting its topography, observing from hill-top to hill-top to fix its geographical locations, searching its rocks for its geology, its fields for its botany, its ruins for its archæology, and the pockets of the friends of the work at home for funds, the exploration of Palestine will go forward to the end. We may be glad and rejoice with those who have helped the good work when it is done.

# VILLAGE INDIANS OF NEW MEXICO.

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BY ERNEST INGERSOLL.

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A complete history of the Village Indians of New Mexico and Arizona would possess for us a deeper interest than that of any other group of tribes among our native races. It would throw great light on the vexed problem of the origin of the red men, perhaps solve it altogether. We feel certain of this, because here, for the first time, we see evidence of a degeneracy from a former higher stage of civilization. Among them we find the most suggestive and coherent of traditions, giving glimpses, at least, into a past which is replete with fascinating interest.

We may naturally group these Indians into two divisions — the Pimas and allied tribes dwelling in the valley of the Rio Gila and southward, and the Pueblos and Moquis, at present restricted to the table lands between the Rio Colorado and Rio Grande, north of the Little Colorado.

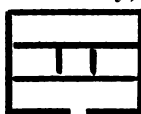
Let us first turn to the Gila River people. There are but three prominent tribes; the Pimas, Papagos and Maricopas. They are now placed on a reservation on the Gila river, but formerly occupied an extensive range north and south, now over-run by wandering bands of the great Apache nation, with which they have no affinities, regarding them only as their ancient and implacable foes.

With respect to these, I have only time to mention that they are non-nomadic, depend entirely for subsistence upon agriculture, which they pursue extensively, and reside in permanent villages of strongly-built dome-shaped huts. They were probably the first occupants of this region.

Abundant and stately ruins (the construction of which is undoubtedly to be attributed to their ancestors) scattered through that region attest that in ancient times this people possessed great skill in architecture, and had made considerable advance toward civilization. They themselves date their present decline from the destruction of their walled towns by the Spaniards, since which they confess that

they have not had the ambition to rebuild the mansions of their forefathers or imitate their luxury. These Gila River Indians are very properly villagers, and their customs are of extreme interest, but we are not so immediately concerned with them to-night as with the Northern tribes.

There is every reason to believe, and the ruins of the upper Gila (the construction of which is undoubtedly to be attributed to their ancestors) tend to prove, that the Pimas were the first occupants of this region. These ruins are best exemplified in a large building in the midst of a very old town, which is firmly constructed of stones set in clay, and must have been at least four stories high, for that



many are yet standing. It was square, and divided into five rooms on the ground floor, as shown in the figure. There was no entrance except by this low doorway (a), and no intercommunication between the rooms on the ground floor, but only in the upper stories.

The pueblos, or "townspeople," who were so called in general by the Spaniards, from the word *pueblo*—a town, include all those tribes of Indians living north of the Little Colorado, who inhabit stone houses. The tribal names have been all but lost under the broader Spanish designation, and I shall make no attempt to revive any except the name *Moquis*.

In comparison with the number which formerly existed, but few pueblos are now occupied, many fruitful causes having combined to diminish this people, besides the disturbance consequent upon the Spanish invasion, chief of which is the fact that much less rain now falls than formerly did over this country, which their traditions (supported by other evidence) tell us was once arable and pleasant. Now nothing can be more desolate. There is only dry dust under your feet, glaring rocks and well-armed cacti around you, and the hottest sun in America over your head. The few rivers rise in the northern mountains, and flow for long distances through tremendous chasms, with scarcely a tributary. Springs are few and far between, and so precious that they are held sacred. It is a cañon country — by which I mean that the real and original surface is *mésa*, or table-land, whose level top is hundreds of feet above you, and you travel through great cracks in this mesa, which have been split by convulsions, or ploughed out by water, or both. Sometimes these cracks or *canons*, are a mile or more wide; often three times as deep as they are broad. There is little timber, and that is only gnarled cedar and piñon pine. Yet, in

such a desert, live this people, and enjoy the very evil of it, because it contributes to their seclusion.

The main inhabited villages are those at San Domingo and San Felipe, near Santa Fe; at Pecos, Zuñi and the Moqui towns on the Little Colorado.

But, as I have remarked, the ruins of their old, substantial towns, abound everywhere in New Mexico, northern Arizona and southern Colorado and Utah, strewn with broken implements and utensils. Some of these equal or approach the modern structures, others far excel them, while not a few were apparently places of fortification and refuge.

Between these people and the Aztecs of Mexico, there is no affinity, but they resemble one another in certain customs and beliefs, which are the common property of all the nations of this section.

In stature the Pueblos are small—the men averaging not more than five feet in height, and the women still less. Their complexions are light, their features thin, bright and intelligent, and the young women are very prepossessing in expression and manner.

Their dress is simply the breech cloth and blanket, some adding a blouse of cotton or deer skin, a waist-belt and buckskin leggings. The women wear a long, cotton, sleeveless tunic, confined round the waist by a colored girdle, and a species of cape, bordered in different colors, fastened round the neck at the two corners and reaching down to the waist, while over the head a shawl is thrown. The feet are protected by neat moccasins of deer skin or woolen stuff, surmounted by leggings of the same material. They have a habit of padding the leggings, which makes them appear short-legged, with small feet. The men bind a handkerchief or colored band about the head. Young women dress the hair in a peculiarly neat and becoming style. Parting it at the back, they roll it round hoops, when it is fastened in two high bunches, one on each side of the head, placing, sometimes, a single feather in the center. Married women gather it into two tight knots at the side, or one at the back of the head. The men cut it in front of the ears and in a line with the eyebrows, while at the back it is plaited or gathered into a single bunch and tied with a band. On gala occasions they paint and adorn themselves in many grotesque ways; arms, legs and exposed portions of the body are covered with stripes or rings, and conical head-dresses and masks of the most absurd and ludicrous kind are worn.

That about their personal appearance which strikes us most forcibly

after seeing other Indians, is their neatness, in which they take much pride. The same regard for order, comfort and cleanliness prevails in their houses, which are furnished with much attention to these two essentials of pleasant home-life. The careful and detailed description by Lieutenant Ives of the Colorado River Exploring Expedition (Report, page 121), of a visit to the Moqui towns, is a most excellent picture of the interior of their houses, and their usages.

On the mesas and in the adjacent valleys they keep immense herds and flocks of horses, asses, cattle and sheep; particularly the latter, which constitute their principal wealth. These are allowed to range wild, or are herded by men appointed by the governor of the town. From the wool of their sheep they manufacture excellent and handsome blankets, similar to those made by the Navajos. These are woven by the men on a loom of their own invention, and worked out so elaborately that a large one will occupy from one to two months in its weaving.

They are not large farmers, because of the unfavorableness of the region; but near their villages, cultivate sufficient cotton, corn, vegetables and green fruit for their own use. They have orchards, too, particularly of peach trees. Their gardens are all irrigated by an ingenious system of canals and devices for retaining the water, which is derived from springs and from huge reservoirs dug in the rock, in which the copious drainage of the short rainy season is saved up.

They excel in making all kinds of pottery, and in finishing and ornamenting the surface. The principal method of manufacture used by them is worthy of description. The clay having been worked into the proper consistency, is drawn out into a cord or wire as thick as your little finger, which is closely coiled on a flat surface until the size of the bottom of the proposed vessel is reached. The cord is then laid on top of the edge of this flat bottom coil, and carried round spirally upward to form the sides of the vessel, expanding and narrowing to the requisite shape. After the shape is completed, the cords are pressed closely together with the fingers or with a small stick, and a series of little indentations formed, which are of themselves quite ornamental. Frequently, however, a glazing is put upon the ware, outside and in, and the objects are painted in colors, either in geometric designs, or with rude flat representations of plants and animals.

Numerous other industries take up their time, such as the making of elaborate saddles and bridles for their horses, in which much silver is used in the way of ornament.

The government, at least among the Moquis, consists of a governor chosen annually from a family in whom this eligibility is hereditary. He gathers about him a cabinet of such officers as the war-chief, the chief-doctors and so forth, who form a national council, make all the laws and sit as the judiciary. Their laws have a high regard for virtue and morality, particularly in the training of the youth, who are carefully instructed in habits of sober, industrious, virtuous living and the duties of citizenship. A sort of secret police watch the young people and at once report any improprieties which are duly punished, sometimes very severely. The laws enjoin upon all women the strictest chastity, yet much licentiousness is permitted and indulged during certain festivals. But, generally speaking, they are temperate and sober in all things.

As warriors they are not renowned, yet fight bravely when the necessity arises. All their belligerent expeditions are to recover stock stolen from them by the Apaches or Navajos, the most accomplished thieves in the world. When starting out, they equip themselves in the skins and heads of animals, grotesque masques and the most fantastic costumes their fancies can invent, adorning themselves and their horses with bright-colored streamers in order to destroy the aim of their enemies. They fight on horse-back in skirmishing order, and display the greatest activity, rapidly shooting their arrows from every position but that which a rider would naturally occupy. They are usually successful in recovering their stock, but rarely pursue the foe or follow up the victory by other attacks. Two weapons peculiar to them deserve mention; one is a sort of boomerang which they hurl with great force, and another the sling in the use of which they are so expert as to kill deer at a distance of 150 yards. All carry a rawhide shield, and most are now well supplied with firearms.

In the process of courtship and marriage they often reverse the usually accepted order of events. If a maiden sees a youth whom she fancies for a husband, she communicates her wishes to her father, who visits the parents of the young man, states his daughter's desire, and inquires what they are able to give him in return for his daughter. This matter satisfied, the young man goes and gets his future wife, when the neighbors set them up in housekeeping with feasts and rejoicing.

Quite often, however, the attractions of a maiden cause her to be wooed first by one of the young braves, who, first having gained the goodwill of her parents, serenades her day after day with his flute,

until she either comes out and takes him at his word, or else declines in a manner unmistakable.

Wives are treated with tenderness and respect. Polygamy is not allowed, and love of home and affection for one another are prominent among the good traits of this simple people.

They seem to have no striking ceremonies connected with their burial rites. The body is carried to the grave on the shoulders of men, and is laid out at full length. Elaborate expressions of grief are indulged in by the women, who are the chief mourners, and songs are chanted. Ten Broeck saw one funeral where a file of women approached and emptied jars of water into the grave; and Emory writes that in one of the pueblos, stones are dashed on to the body with great violence, the intention being to drive out evil spirits.

Their religion is a matter dear to them all; it amounts to sun worship. They believe in an all-powerful all-wise Creator, who long ago sent to the earth a special ambassador and teacher in the person of Montezuma. Montezuma remained here a long time, instructing them in the arts they now know, and founded pueblos, especially at Pecos. At that time these deserts were fruitful, and rain fell in plenty. When Montezuma died, he told them that after a certain time, during which drouth and other calamities should intervene, the fruitfulness would return to the desert, and he would come again to claim their homage. Meanwhile he enjoined upon them the care of the sacred fire and other religious duties. Hence they revere Montezuma.

The sun they regard as the visible semblance of God, through whose rays He sends His blessings. In this sense they worship the sun. Second only in importance as an agent of good to the inhabitants of the earth, is water; so they regard springs as sacred, and make annual offerings and prayers to insure their continuance. Lizards, toads and newts, because they are intimately associated with fountains, are also venerated. Just now they think the signs of Montezuma's return are multiplying, and every morning a sentinel ascends to the highest point of the village to watch the rising sun, hoping that its first radiant beams may reveal the approach of their great captain and redeemer. And who knows but some golden morning this beautiful faith may be realized to these simple believers?

I have purposely reserved until the last any account of the architecture of these nations, which is the great distinguishing feature between them and their more savage neighbors. Their towns are

usually situated on top of the table-lands, but the most ancient were in the valleys. Everywhere, past and present, the typical "pueblo" was built in a series of retreating terraces around three sides of a quadrangle, with a protecting wall across the open side. This great block of houses shelters the whole village, each family occupying a suite of rooms. But sometimes more than one of these are together in a large town, and the houses do not meet but project over the street below, and are connected by bridges, and there may be as many as six or seven terraces. In some towns the terraces are on the outside of the building, or both sides are terraced, and in front of each terrace the wall is carried up into a parapet or battlement.

As there is no inner communication, the access from the ground to the first story, and from that to the next, is by ladders, which are drawn up at night or when danger threatens. The outer walls of the ground terraces are entirely solid; hence, to enter the rooms on the ground floor, you must descend through trap-doors in the ceiling. These rooms are ordinarily used only for storage.

Houses are common property, and both men and women assist in building them, the men making the wooden frames and the women building the walls. In place of lime for mortar, they mix ashes with earth and charcoal. Thus, also, they make large blocks of sun-dried brick. But some of the towns are built of stones set in mud. This makes a serviceable wall, but we shall see that anciently these people had a knowledge of architecture and design, far superior to their present skill.

Interiorly the rooms are divided from one another by substantial partitions of wood, and the floors are of heavy beams, covered with bark and brush, over which a layer of mud is spread and packed firm. Each room is devoted to a special use, as with us, and there is every appearance of space and comfort for the occupants. On the balconies around the doors opening upon them, the villagers congregate to gossip and smoke. "They take great pride in their, to them, magnificent structures, averring that as fortresses they have ever proved impregnable. To wall out black barbarism was what the Pueblos wanted; under these conditions, time was giving them civilization." Their traditions ascribe to the north-west the direction of their origin; and it is in that direction that we find ruins of the ancient architecture, older than are to be found elsewhere. Of these antiquities but recently (September, 1874) brought to our knowledge by a portion of the U. S. Geological Survey to which it was my good for-



tune to be attached, I shall now speak, giving a rapid account of our search for them.

A little preliminary geography is necessary, however. Just along the south-western border of Colorado the mountains sink almost abruptly into table-lands, which stretch away to the Gila and Colorado rivers. Rising in northern New-Mexico, at the end of the main range of the Rocky Mountains, which here stops short, and flowing south and west into Arizona, thence north into Utah twenty-five or thirty miles west of the Colorado line, then gradually westward into the Colorado river, is the Rio San Juan, the largest river of this district. It receives but one tributary of consequence from the south, but from the north many streams draining the southern slopes of the mountains, the principal of which are the Rio Pietra, Rio Las Animas, and its branch the Florida, Rio La Plata, Rio Mancos, and Montezuma Creek, naming them from east to west.

Leaving the main camp stationed in Baker's Park at the head of the Rio Las Animas our small subdivision started for a rapid reconnaissance of the valleys of these tributaries where we hoped to find ruins of high archæological interest.

Our marches carried us first over high ragged volcanic mountains, wild and picturesque; then down the valley of the Animas, and across a very pleasant foot-hill country westward to the Rio Mancos where it finally leaves the mountains. Following this river down we soon began to come upon mounds of earth which had accumulated over fallen houses, and about which were strewn an abundance of fragments of pottery variously painted in colors, often glazed within, and impressed in various designs without. Then the perpendicular walls that hemmed in the valley began to contract. That night we camped under some forlorn cedars, just beneath a bluff 1,000 or so feet high, which, for the upper half, was absolutely vertical. This was the edge of the table-land, or *mesa verde* which stretches over hundreds of square miles about here, and is cleft by these cracks or cañons through which the drainage of the country finds its way into the great Colorado. In wandering about after supper we thought we saw something like a house away up on the face of this bluff, and two of us clambered over the talus of loose débris across a great stratum of pure coal, and, by dint of much pushing and pulling, up to the ledge upon which it stood. We came down satisfied, and next morning Mr. Jackson carried up our photographic kit and got some superb negatives. There, 700 measured feet above the valley,

perched on a little ledge only just large, enough to hold it, was a two-story house made of finely-cut sandstone, each block about fourteen by six inches, accurately fitted and set in mortar now harder than the stone itself. The floor was the ledge upon which it rested, and the roof the overhanging rock. There were three rooms upon the ground floor, each one six by nine feet, with partition walls of faced stone. Between the stories was originally a wood floor, traces of which still remained, as did also the cedar sticks set in the wall over the windows and door; but this was over the front room only, the height of the rocky roof behind not being sufficient to allow an attic there. Each of the stories was six feet in height, and all the rooms, up stairs and down, were nicely plastered and painted what now looks a dull brick-red color, with a white band along the floor like a base-board. There was a low doorway from the ledge into the lower story, and another above, showing that the upper chamber was entered from without. The windows were square apertures, with no indication of any glazing or shutters. They commanded a view of the whole valley for many miles. Near the house several convenient little niches in the rock were built into better shape, as though they had been used as cupboards or caches; and behind it a semi-circular wall inclosing the angle of the house and cliff formed a water reservoir holding two and a-half hogsheads. The water was taken out of this from a window of the upper room. In front of the house, which was the left side to one facing the bluff, an esplanade had been built to widen the narrow ledge and probably furnish a commodious place for a kitchen. The abutments which supported it were founded upon a smooth steeply-inclined face of rock; yet so consummate was their skill in masonry that these abutments still stand, although it would seem that a pound's weight might slide them off.

Searching further in this vicinity we found remains of many houses on the same ledge, and some perfect ones above it quite inaccessible. The rocks also bore some inscriptions — unintelligible hieroglyphics for the most part — reminding one of those given by Lieut. Whipple in the third volume of the *Pacific Railroad Reports*. No doubt also we passed very many edifices in the cliffs, which, for want of sharp eyes or a field-glass, escaped our notice. The glare over everything, and the fact that the buildings, being formed of the rock on which they rested, were identical in color with it, increasing the difficulty made sufficiently great by their altitude.

Leaving here we soon came upon traces of houses in the bottom of the valley, in the greatest profusion, nearly all of which were entirely

destroyed, and broken pottery everywhere abounded. The majority of the buildings were square, but many round, and one sort of ruin always showed two square buildings with very deep cellars under them and a round tower between them, seemingly for watch and defense. In several cases a large part of this tower was still standing. These latter ones, judging from the analogy of the *estufas* of the present Moquis, were the remains of council-houses, which, at the present time, are built in circular form and in the strongest manner, with subterranean cellars, forming an indispensable accompaniment of every pueblo village. The best example of this consisted of two perfectly circular walls of cut stone, one within the other. The diameter of the inner circle was twenty-two feet and of the outer thirty-three feet. The walls were thick and were perforated apparently by three equi-distant doorways. Was this a temple?

We continued to meet with these groups of destroyed edifices all day, but nothing of especial interest except two or three round towers, and no perfect cliff-houses, until next morning, when a little cave high up from the ground was found, which had been utilized as a homestead by being built full of low houses communicating with one another, some of which were intact, and had been appropriated by wild animals. About these dwellings were more hieroglyphics scratched on the wall, and plenty of pottery, but no implements. Further on were similar, but rather ruder, structures on a rocky bluff, but so strongly were they put together that the tooth of time had found them hard gnawing; and, in one instance, while that portion of the cliff upon which a certain house rested had cracked off and fallen away some distance without rolling, the house itself had remained solid and upright. Traces of the trails to many of these dwellings, and the steps cut in the rock, were still visible, and were useful indications of the proximity of buildings otherwise unnoticed.

Keeping close under the mesa, on the western side, you never find houses on the eastern cliff of a cañon, where the morning sun, which they adored, could not strike them full with its first beams, one of us espied what he thought to be a house on the face of a particularly high and smooth portion of the precipice, which there jutted out into a promontory, up one side of which it seemed possible to climb to the top of the mesa above the house, whence it might be possible to crawl down to it. Fired with the hope of finding some valuable relics of household furniture in such a place, one of the gentlemen volunteered to make the attempt, and succeeded. He found it well-preserved, almost semi-circular in shape, of the finest work-

manship yet seen, all the stones being cut true, a foot wide, sixteen inches long and three inches thick, ground perfectly smooth on the inside so as to require no plastering. It was about six by twenty feet in interior dimensions and six feet high. The door and window were bounded by lintels, sills and caps of single flat stones. Yet all this was done, so far as we can learn, with no other tools than those made of stone, and in such a place that you might drop a pebble out of the window 500 feet plumb.

Photographs and sketches completed, we pushed on, rode twenty miles or more, and camped just over the Utah line, two miles beyond Aztec Springs. There were about these springs, which are at the base of the Ute mountain, almost a corner-post for the four territories, formerly many large buildings, the relics of which are very impressive. One of them is 200 feet square, with a wall twenty feet thick, and inclosed in the center a circular building 100 feet in circumference. Another, near by, was 100 feet square, with equally thick walls, and was divided north and south by a very heavy partition. This building communicated with the great stone reservoir about the springs. These heavy walls were constructed of outer strong walls of cut sandstone, regularly laid in mortar, filled in with firmly packed fragments of stone. Some portions of the wall still stand twenty or thirty feet in height, but, judging from the amount of material thrown down, the building must originally have been a very lofty one. About these large edifices were traces of smaller ones, covering half a square mile, and out in the plain another small village indicated by a collection of knolls. Scarcely anything now but white sage grows thereabouts, but there is reason to believe that in those old times it was under careful cultivation. Evidently these thick walls were the foundations of old terraced pueblos, an unusually large community having grown up about these plentiful springs.

Our next day's march was westerly, leaving the mesa bluffs on our right and gradually behind. The road was an interesting one, intellectually, but not at all so physically — dry, hot, dusty, long and wearisome. We passed a number of quite perfect houses, perched high up on rocky bluffs, and many other remains. One occupied the whole apex of a great conical bowlder, that ages ago had become detached from its mother mountain and rolled out into the valley. Another worth mention was a round tower, beautifully laid up, which surmounted an immense bowlder that had somehow rolled to the very verge of a lofty cliff overlooking the whole valley. This was a watch-tower, and we were told that almost all the high points were occupied

by such sentinel boxes. From it a deeply worn, devious trail led up over the edge of the mesa, by following which we should, no doubt, have found a whole town. But this was only a reconnoissance, and we could not now stop to follow out all indications.

Time was short, and we must gallop on to where tradition tells us the last stand was made against the invaders, into whose rude grasp these aborigines must surrender their homes. Toward night we reached it. The bluffs at our right had sunk into low banks of solid red sandstone, white at the base; on the left frowned tall rock-buttresses; and the barren hills sloped away to the south behind them. Ahead the valley closed into a cañon, and where we stood and off to the right the surface was a succession of low domes of bare sandstone, worn into gullies and chiseled into pot-holes by ancient rivers and modern rains, devoid of soil, supporting only a few stunted cedars rooted in the crannies, bleached and ghastly, and garish under the September sun. Brilliant cliffs, wierdly carved, ranged themselves behind; and right in the foreground, thrust up through the very center of one of these sandstone domes, stood a ragged chrystone — a volcanic dike — thin, shattered and comb-like. It was a scene of despair and desolation, enhanced rather than softened and humanized by the two great stone towers that stood near by, and the fragments of heavy walls that once defended every approach to the habitations about the chrystone.

The story of these ruins, which the Village Indians themselves tell you is the following, and we can only attempt to improve it by saying they may have left too much out of the account climatic changes tending to diminish the supply of water, which has gradually driven all human occupation from these valleys. Certain it is an agricultural population could not now exist there.

The story is this: Formerly the aborigines inhabited all this country we had been over, as far west as the head-waters of the San Juan; as far north as the Rio Dolores; west, some distance into Utah, and south and south-west throughout Arizona, and on down into Mexico. They had lived there from time immemorial — since the earth was a small island, which augmented as its inhabitants multiplied. They cultivated the valley, fashioned whatever utensils and tools they needed very neatly and handsomely out of clay and wood and stone, not knowing any of the useful metals, built their homes and kept their flocks and herds in the fertile river bottoms, and worshiped the sun. They were an eminently peaceful and prosperous people, living by agriculture rather than by the chase. About a thousand years ago, however, they were visited by savage strangers

from the north, whom they treated hospitably. Soon these visits became more frequent and annoying. Then their troublesome neighbors — ancestors of the present Utes — began to forage upon them, and at last to massacre them and devastate their farms; so, to save their lives at least, they built houses high upon the cliffs, where they could store food and hide away till the raiders left. But one summer the invaders did not go back to their mountains, as the people expected, but brought their families with them and settled down. So, driven from their homes and lands, starving in their little niches on the high cliffs, they could only steal away during the night, and wander across the cheerless uplands. To one who has traveled these steppes, such a flight seems terrible, and the mind hesitates to picture the suffering of the sad fugitives.

At the christone they halted and probably found friends, for the rocks and caves are full of the nests of these human wrens and swallows. Here they collected, erected stone fortifications and watch-towers, dug reservoirs in the rocks to hold a supply of water, which, in all cases is precarious in this latitude, and once more stood at bay. Their foes came, and for one long month fought and were beaten back, and returned day after day to the attack as merciless and inevitable as the tide. Meanwhile the families of the defenders were evacuating and moving south, and bravely did their protectors shield them till they were all safely a hundred miles away.

Climbing carefully to the top of the dike, mapping out the plan of the ancient fortifications, listening to the fearful concussion of a stone hurled from the top, feeling how absolutely safe a garrison would be there so long as they could hold out against hunger and thirst, it required but little faith to believe the tradition of this valley of death, whose broad slopes of white sandstone were once crimsoned and recrimsoned with human blood. The beseigers were beaten back and went away; but the narrative tells us that the hollows of the rocks were filled to the brim with the mingled blood of conquerors and conquered, and red veins of it ran down into the cañon. It was such a victory as they could not afford to gain again, and they were glad when the long fight was over to follow their wives and little ones to the south. There, in the deserts of Arizona, on well-nigh unapproachable, isolated bluffs, they built new towns, and their few descendants — the Moquis — live in them to this day, preserving more carefully and purely the history and veneration of their forefathers, than their skill or wisdom. It was from one of their old men that this traditional sketch was obtained.

# TOPOGRAPHY AND PHYSICAL RESOURCES OF THE STATE OF NEW YORK.

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BY GEN. EGBERT L. VIELE.

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MR. PRESIDENT AND MEMBERS OF THE GEOGRAPHICAL SOCIETY. —

Several years have elapsed since the subject of a topographical survey of the State of New York was made a matter of special report by a committee of the American Geographical Society, consisting of Mr. John Jay, Col. F. A. Conkling and myself. This report, which is found in the Bulletin of the Society for 1856, volume 2, presents a clear statement of the great value of such a survey, and was followed by a memorial to the State Legislature; but, as the object sought to be attained was more general than local in its character, it did not receive that individual attention which seems to be requisite to success in all legislative action. Hence, this important public measure was suffered to pass unnoticed, and has remained unacted upon to this day.

As a member of the committee, to whom the subject was referred, it awakened in my mind a very deep interest, increased by a natural feeling of State pride, eventuating, through the coincidence of professional proclivities, in the accumulation of a large amount of data pertaining to it, and at length resulting in the preparation of a topographical map of the State, which, while making no claim to the accuracy of a geodetic survey, has nevertheless, the merit of general truthfulness, and on the scale to which it is drawn, renders unappreciable many unavoidable errors of detail, while at the same time, it furnishes a clear exponent of those grand physical developments, which constitute the wealth of the State and excite the just pride of its citizens.

A complete description of the natural features of the State, and its vast mineral and industrial resources, would furnish material for many interesting volumes. In fact, a score of volumes upon this subject already exist, the results of careful and prolonged examinations, extending through a period of many years, and embracing nearly all the branches of natural history. These pages, while reflecting the highest degree of credit upon the scientific skill and

assiduity of their authors, are deprived of much of their value by the absence of accurate topographical maps, upon which the information acquired could be graphically delineated.

While the map now executed may not entirely suffice for all the purposes of this delineation, it exhibits nevertheless, the physical characteristics of the State in their relative proportion, while the gradual changes of its natural features, through the successive stages of continental development, can be traced in no uncertain lines.

#### THE INDIVIDUALITY OF THE STATE.

No other one of the United States possesses such a marked individuality as the State of New York. Whether we regard the magnitude and extent of its rivers and lakes, the grandeur and beauty of its scenery, its broad and productive valleys, its lofty mountain chains, its successful plans of internal improvement, or its teeming population and busy industry, we find it in its expanse of territory, its fertile soil and genial climate, in the general distribution of its enormous aggregate of water-power, and in all its vast accumulation of material resources, an "*imperium in imperio*," without an equal, and without a rival.

Possessing the natural highway to the populous and luxuriant west, and the gateway to the Canadas, it has acquired a prominent position in the confederacy of States, while its metropolis has become the commercial entrepôt and financial center of the continent. Its position in the past has been no less commanding than it is in the present.

Its annals form a complete chapter in the history of American civilization. Its statesmen and soldiers have been pre-eminent in the council and the field; and the fires of patriotism have always burned brightly upon the altars of its people. While in the more remote past, those early days of conquest and settlement, when life was a daily and hourly struggle to subdue at once the wilderness and its savage inhabitants, the history of the State is but one long record of self-sacrifice and heroic deeds, worthy of any race and nation that has ever lived. No less remarkable is the history of the aboriginal tribes who occupied the State from the ocean to the lakes, when the European landed on its shores. The Iroquois or Six Nations, ranked the first among the red men of America. They were far in advance of all their barbarian compeers. They had a confederation for offense and defense, and possessed the elements of a rude civilization. They welcomed the white man when he came, and shared with him their



substance, while their rude industry became the first wealth of the colonists. By their skill and superior intelligence, and their bravery, they dominated over all the tribes east of the Alleghanies, and south to the Gulf of Mexico, and have been not inaptly termed the Romans of the western world, for their orators were as eloquent as Cicero, and their warriors as brave as the legions of Cæsar. Yet this once powerful race, these chieftains "to the manner born," whose council fires were as numberless as the stars in heaven, have passed from the face of the earth, and left no monument to tell of why they lived, or how they died. Over their graves, powerful nations have disputed the mastery of the soil, and in the progress of events, all vestiges of the aborigines have been obliterated. In a single century the race has disappeared from its borders, and in that short period of time, the homes and temples of a new civilization have filled all its limits. The wilderness has been made to blossom as the rose; opulent and populous cities rise up on every hand, while nearly five millions of people, representing the arts and industries of every nation have, under the ægis of a free government and salutary laws, achieved a degree of general prosperity heretofore unknown among any people. That this prosperity is due in a large measure to the geographical position occupied by the State, and in a still greater degree to the topographical configuration of the surface, is clearly shown by an examination of those physical characteristics, the principal features of which it is the object of this paper to delineate.

#### THE GEOGRAPHICAL POSITION OF THE STATE.

The geographical limits of the State extend from  $71^{\circ} 50'$  to  $79^{\circ}$  of longitude west from Greenwich — and from  $40^{\circ} 29' 40''$  to  $45^{\circ} 0' 42''$  north latitude, embracing  $8^{\circ}$  of longitude and  $5^{\circ}$  of latitude, being 320 miles long and 312 miles broad, and containing 47,156 square miles, or 30,179,840 acres. On the north is Lake Ontario, containing 6,900 square miles of water surface, and the St. Lawrence river and Canada. On the east are Vermont, Massachusetts and Connecticut. On the south are New Jersey and Pennsylvania. On the west Lake Erie, with an area of 7,800 square miles, and a portion of Canada. The area included within these limits is in many respects the most remarkable portion of the American continent. Geology tells us that of all the land now in existence, the first that rose above the waste of waters in the earliest periods of creation, lies within these borders; that long ere the crags of Jura,

the hights of Chimborazo, or the lofty Cordilleras were created, the sun shone here upon the shore of a vast ocean, whose limits were the great globe itself. That while yet the sites of Babylon and Tyre, of Carthage and of Rome, were hidden beneath the sea, created life moved along the old silurian beach, whose tidal lines across the State are as distinctly marked to-day as they were when the waves of the primitive ocean beat upon the shore. The successive geological evolutions which have been wrought out during the long ages that since then have come and gone, are inscribed upon these mountains, hills and valleys, as upon the pages of a book, where science reads the history of the material world. On no other continent, and in no other spot, are the records of the past so clearly defined or so easily read. In seeking a key with which to analyze and describe the topographical characteristics which have thus been developed, we find that the mountain system of the State is the extension and in part the termination of the great Appalachian chain which forms the easterly range of the continental system of mountains. This broad series of parallel ridges, with intervening valleys, which extends from near the Gulf of Mexico on the south, to the Gulf of St. Lawrence on the north, having a mean elevation of 2,500 feet (at one point rising as high as 6,000 feet), forms an almost insurmountable barrier between the Atlantic coast and the interior of the continent. As it enters the State of New York from the south, this mountain range, which in some places is 200 miles broad, becomes narrower and depressed, and while a portion of it sinks beneath the later sedimentary formations which overlies the greater part of the State, another portion, passing to the east of the Hudson river and across the State of Massachusetts, forms in its continuation the Green mountains of Vermont and the White mountains of New Hampshire. At West Point, on the Hudson, where this formation is developed in all its grandeur, the mountain chain is riven asunder, and the lordly river, whose deep channel would float the navies of the world, passes on majestically to the ocean. No scenery on the continent can rival the Highlands of the Hudson at this point; and when we consider that this is the only spot where the thousand miles of rocky barrier is broken, giving to the State of New York the key with which commerce has opened the treasure-house of the west, and brought from thence the willing tribute of its abundance to this great city by the sea; when we find a similar result, although on a scale less grand and imposing, produced by the remarkable erosion of the valley of the Mohawk, thus extending the facilities of commerce to the great lakes

— we no longer wonder at the events which one century has brought about. Eighty years ago there were more people living in Massachusetts than in New York, also in Pennsylvania and even in North Carolina, and Virginia had double the population of this State; while to-day New York has a million more inhabitants than the whole country had at that time.

To understand more fully the influence of these topographical lines of lowest level, we have only to compare the gradients of the railways which extend from the Atlantic to the west. All the railways south of this line extending from the sea coast to the lakes and Mississippi valley, pass the mountain range at various elevations; the Erie road at an elevation of 1,800 feet, with grades of ninety feet per mile; the Pennsylvania road at an elevation of 2,200 feet, with grades of 125 feet to the mile; the Baltimore and Ohio at an elevation of 2,600 feet, with grades for fifteen continuous miles of 116 feet; and the Chesapeake road in Virginia at 2,000 feet, with corresponding grades; while from the Hudson, at or near Catskill, to the Mohawk, a distance of fifty-three miles, the entire ascent is but 220 feet, which can be overcome by grades not exceeding thirty feet to the mile, and the highest summit thence to Lake Erie, of 193 feet, is overcome at grades not exceeding twenty feet to the mile, while the remainder of the line is characterized by a generally level grade. Now, as the cost of draught on a railway is nearly as the power employed, so that it costs twice as much to carry a load with an ascending grade of twenty-four feet as to carry it on a level route, and as this element of railway construction increases in importance with the increase of traffic, the value to the State of its low level line of transportation is apparent.

#### THE RIVER SYSTEM OF THE STATE.

The river system in its influence on the general prosperity of the State is even more remarkable than its mountains, whether we view it as a system of drainage, for this widely extended territory, or regard it as the local and concentrated source of a semi-continental river system, whose waters wash the borders of half the States of the Union; or whether we contemplate its wonderful adaptability in nearly all its wide-spread ramifications to the industrial interests of the inhabitants of every section of the State, and the transportation facilities it affords for internal commerce. It may almost be said, that every drop of water that falls upon the surface is conserved for a useful purpose. Wherever a stream ceases to be navigable it becomes

a mill-power, and the great value of those inequalities which at first glance give a rugged aspect to the surface, becomes apparent. The estimated number of interior lakes is 648, and the area of lake surface 466,550 acres. The average height of these natural reservoirs, above the level of the sea, is 1,000 feet; one of the hundred lakes in the Adirondack region, is 3,000 feet above the sea, and in that region the average height is over 1,500 feet, while all the rivers and streams that emanate from them, fall with great rapidity of descent towards the sea level. The amount of water-power which is thus developed, is simply enormous. If the entire motive-power of this kind existing in the State were properly utilized, it would be greater than that of all the rest of the United States, excluding the State of Maine. The principal rivers of the State are the Hudson, the Mohawk, the Delaware, the Susquehanna, the Chenango, the Chemung, the Genesee and the Alleghany, each having distinct valleys of drainage, while the Adirondack region is drained by the Black, the Rackette, the Grass, the St. Regis, the Au Sable, the Saranac, and the Sacondaga. The Hudson drains all of the Appalachian region of the State, and with the Sacondaga drains the south-easterly portion of the Adirondack region. The Mohawk, although lying along the southerly base of the Adirondack and having a very broad natural valley, has a limited area of drainage. Its principal affluent being the Schoharie, which drains the southerly and westerly slope of the Catskill mountains. The Delaware drains the counties of Delaware and Sullivan, and a large portion of New Jersey and Pennsylvania. The Susquehanna which takes its rise in Otsego lake, in Otsego county, drains, together with its branches, the Chenango and Chemung, most of the southern tier of counties. While the Genesee, the only river flowing directly north, drains a comparatively limited area beyond its own immediate valley. The Allegany with its branches, drains the south-western portion of the State.

#### THE DIVIDING VALLEYS.

The area of the State is trisected by the valleys of the Hudson and the Mohawk, which intersect each other at right angles, and constitute the key to its topography.

These valleys were the hunting trails and the war-paths of the aborigines; the strategic lines of contending armies of Europeans; and are now the broad avenues of a peaceful commerce, the bond of a perpetual unity, and the exponent of the increasing prosperity of the nation.

The three divisions which are thus formed, are each peculiarly distinct, both in their topography and their geology. Each seems to have separate epochs of existence, each is a separate volume of the earth's great legends of antiquity.

### THE FIRST DIVISION.

The first division is that portion of the State which lies east of the Hudson river. Although constituting but seven of the sixty counties into which the commonwealth is politically divided, its population is larger than any of the States of the Union with the exception of five, and there are two States whose combined area does not equal it in extent, while one other is but a little larger. Geologically, this district is almost entirely composed of the remnant of a continent which is no longer in existence. Itself the crystallized and metamorphosed sediments of wasted mountains, it became in turn the rocky shore of a vast sea in which the present continent had its origin. The rocks, minerals and metallic deposits of this region, have been the study and puzzle of geologists for years, while even now it periodically vibrates and trembles with the earthquake-shock that tells of dormant life or slumbering fires beneath it. The topographical descriptions of this district begin with the island of Manhattan which forms the lower portion of the city of New York. This island is twelve miles long and from one-half a mile to two miles and a quarter broad. The basic rock is gneiss, with the exception of a deposit of limestone at the northern extremity. The strata have been turned up to a vertical position, and an elevated ridge extends nearly the whole length of the island, varying in height from 70 to 125 feet. The ridge is broken at the northern end of the island, admitting the passage of the waters of the Hudson river, but rises again in Westchester county, and continues northward at an increasing elevation. At the north-east point of the island are extensive alluvial flats, a portion of which is overflowed by the tide. Formerly a number of running streams of water existed on the island, the general course of which was north and south, emptying into the adjacent waters, where breaks in the rocky formation would admit. These streams have nearly all been filled up and their flow obstructed to the manifest detriment of health.

No metalliferous deposits have been found, but excellent building stone of granite and limestone have been quarried in several localities.

The original topography is rapidly disappearing in the grading of avenues and construction of buildings.

Passing northward to the main land we find the same basic rock. The single elevated ridge of the island gives place to a succession of nearly parallel ridges with intervening valleys. A section across Westchester county at Hastings, twenty miles from the city hall, shows six of these ridges. There are, however, two predominant lines of elevation in this county attaining an elevation of 1,500 feet, one along the Hudson, and the other on the easterly border. They all become merged into the high lands of Putnam county. These highlands consist of several steep rocky ranges extending in a north-east and south-west direction, separated by deep, narrow valleys. Numerous lofty peaks tower above the surrounding mountains, from which are views of great extent and picturesque beauty. As far as the eye can reach, a continuous series of rocky summits extend to the farthest horizon. Interspersed between the ridges, and sometimes attaining very great elevations, are many fine lakes, some of them very extensive sheets of water, a large number being often visible from a single point of view, sparkling in the sunlight like jewels in a diadem of mountains with which nature has crowned a glorious landscape. The deep shadows of the narrow valleys serve to heighten the beauty of the scene by increasing the relief of the mountains, while the rivers, which meander at their base, appear like tortuous threads of silver. The low intervening hills of gravel and sand, formed in the whirling torrents of an early period, are clothed with emerald verdure or covered with luxuriant forests. Geologically, the highlands of Putnam county as well as those of Orange county, on the opposite side of the Hudson river, are the continuation of the primitive rocks of the Appalachian chain. In Dutchess county the Mattewan mountains form the northern limit of "the Highlands" in this State. Its highest summits attain the elevation of 1,700 feet. Next to these mountains on the east, and separated from them by a broad valley, are the Taghanick mountains, which extend along the east border of Dutchess county, and northerly through Columbia, Rensselaer and Washington counties into Vermont, forming the foot hills or easterly slope of the Green Mountains. This formation is entirely distinct from that of the Highlands, being composed of metamorphic limestone and slate. Parallel to this range in the west are the Petersburg mountains, which, commencing in an elevated plateau in the northern part of Columbia county, extends through Rensselaer and Washington counties. These mountains belong geologically to what is known as the Hudson River group,

composed of shale, slate and limestone. In some places they rise as high as 2,000 feet above the sea. The declivities are usually steep. Nearly parallel to this and still farther to the west, there is in Washington county a range known as the Palmerstown mountains, which forms a portion of the Adirondack system. They consist principally of gneiss, granite, sandstone and impure limestone. Their sides are very precipitous and broken, and their summits are wild, irregular masses of naked, barren rocks. The valleys between them are narrow and rocky, often bordered by precipices many hundred feet high. These, in brief, constitute the chief topographical features of this division of the State.

Hydrographically, the Hudson River forms the entire eastern border, and between all the ranges and lines of elevations even down to the lesser ridges, there are drainage streams of greater or less extent; some are rivers of no inconsiderable volume, supplying with their numerous branches a large aggregate of water-power, which is made available for the use of innumerable mills and factories. The general course of the streams is southerly, and nearly all of them empty into the Hudson. The principal of these are the Bronx, the Nepperhan, and the Croton, which, rising in Dutchess county and passing through Putnam and the northern part of Westchester, constitutes with its branches the chief source of water supply for the City of New York. Three large storage reservoirs constructed in Westchester and Putnam counties, holding many millions of gallons, retain these waters for distribution and use when the ordinary flow of the river fails to meet the demand. The Sawkill, Fishkill and Wappinger's Creeks, the Claverack and Kinderhook, the Hoosick and Baten Kill, are all noted streams which drain the principal valleys. Besides these, are numerous and beautiful lakes throughout the entire division, the resort of many thousands of people in the summer months. The economic resources of all this region are varied and valuable, embracing many varieties and extensive deposits of granite, marble, serpentine steatite, slate and iron ore.

#### GRANITE.

Granite occurs abundantly in New York, Westchester, Putnam and Dutchess counties. It presents all varieties of texture, from a very coarse grained rock to one almost perfectly compact. In color it varies as much as in texture. It is white, red, gray, yellowish and bluish gray, according to the color of the minerals forming it. The color of the feldspar usually determines that of the mass. It occurs

in beds, in veins, in interstratified masses, and in knobs, knots and protruding masses, in which no connection with beds or veins have been traced. The more common mode of its occurrence is in beds ten to one hundred feet thick, interstratified with gneiss.

The materials are of the best quality, easily quarried in large blocks suitable for columns, cornices, etc., easily dressed, enduring as time, which the naked crags themselves will testify.

#### MARBLE.

The granular limestone or marble of this region, especially that found in Dutchess, Columbia and Westchester counties, is very extensive, and does not yield to any other mineral deposit in those counties in prospective value. Marble quarries are extensively worked in many portions of this limestone range. It extends through the greater part of the length of these counties and crops out with a variable breadth from a few hundred yards to several miles. The marble business is one that will always employ much labor and capital, and as this valuable material is inexhaustible in any definite period of time, it will always be an unfailing source of wealth.

#### SERPENTINE.

The Serpentine quarries of Putnam county, are sufficient to supply the market, not only of our own country, but the world, with this kind of ornamental marble for a long period of time. It is a beautiful material when polished, and is exceedingly rare in Europe. In ancient times it was used in some of the Spanish palaces with fine architectural effect.

#### STEATITE.

Steatite, commonly known as soapstone, is very abundant in Putnam and Dutchess counties. It is quarried in large blocks, beautifully spotted and colored. Good quarries of this rock are very valuable, and the use of the material is steadily increasing.

#### IRON ORE.

The iron ore of Westchester, Putnam, Dutchess and Columbia counties is very abundant and of the best quality. It exists in extensive beds in the form of hematite, and also in immense deposits as magnetic oxide. Many mines are in active operation, and numerous furnaces have been constructed along the Hudson river and in the interior. The quantity of pig-iron manufactured is increasing every year, employing many men and a large capital.



## SILVER AND LEAD.

Deposits of silver and lead have been found in Dutchess county, and have been worked with more or less success. Recent explorations and analysis indicate extensive and valuable veins of silver, and arrangements for deep mining are now being projected.

## INTERIOR COMMUNICATION.

Extensive lines of railway, both longitudinal and transverse, with numerous lateral branches, have been constructed throughout the whole of this region. Along the east bank of the Hudson, and through the valleys of the Nepperhan, the Bronx, the Croton, the Hoosick, and Baten Kill, railways have been built connecting this section with all the New England States. In the north, through Washington county, the Champlain canal connects the waters of Lake Champlain with those of the Hudson. Large and populous cities, prosperous towns and villages, an active, intelligent and enterprising population engaged in the industrial pursuits of commerce, agriculture, mines and manufactures, exhibit throughout the length and breadth of this area unrivaled evidence of energy and thrift.

Properly speaking, Long Island and Staten Island, with the smaller insular territory in the harbor of New York, as well as the harbor itself, belong topographically to this division.

Long Island, 120 miles long by ten broad, is of diluvial origin.

Staten Island, fourteen miles long by eight broad, is a granitic formation interspersed with serpentine and steatite. There are valuable deposits of hematite iron ore and fire-clay on this island. The quality of the iron ore and the advantages of its proximity to tide-water, are attracting the attention of ironmasters, and it is stated that iron can be manufactured here at an expense much less than at any other locality.

## HARBOR OF NEW YORK.

The harbor of New York consists of the harbor proper and an outer roadstead, called the Lower Bay. The latter being partially protected from the sea by the island of Sandy Hook (almost a peninsula), which stretches out from the coast of New Jersey in a northerly direction, about six miles in length and three-quarters of a mile broad. The main channel into the bay passes near the extremity of Sandy Hook, between which and the coast of Long Island, a distance of seven miles, is an immense shoal, through which passes three lesser channels into the harbor. The bar to the entrance

lies three miles off Sandy Hook. On it there is a depth of water of from twenty-one to twenty-three feet. The Lower Bay contains one hundred square miles of water surface, receiving from the west the waters of the Raritan river, which is seventy-four miles in length, passing through the red sandstone formation of New Jersey. The outer bay connects with the harbor proper at the Narrows, a strait formed by the approximation of the shores of Long Island and Staten Island. There is also another connection formed around the western shore of Staten Island by the Staten Island Sound, as it is called, which meets at Newark bay the united waters of the Passaic and Hackensack rivers. The former is seventy miles in length, passing through the new red sandstone formation, and having at one point a fall of seventy feet. The latter is forty miles in length, passing through red sandstone and conglomerate. Newark bay is also connected with the harbor by the Kill von Kull, a narrow strait.

The principal affluent of the harbor is the Hudson river, which rises in the mountains of Hamilton and Essex counties, New York ; is 350 miles long, passing through granite and calcareous formations ; the principal tributary being the Mohawk, 155 miles long, with a fall of seventy-five feet, two miles from the junction. The Hudson is navigable for large ships a distance of 118 miles. It is connected with the great lakes by the canal at Albany, and with Lake Champlain and the St. Lawrence river by the northern canal. The river divides at the northern extremity of Manhattan island, forming what is called the Harlem river, which empties into the East river, an arm of the sea connecting the harbor with Long Island sound—thus forming a second opening to the ocean. The harbor contains twenty-four miles of water surface. The harbor thus formed is the finest on the continent, if not in the world. The navies of all nations can ride in safety within its limits, and the largest vessels ever constructed can enter without difficulty, and yet it is but one of the many lavish gifts bestowed by nature on this favored State.

### THE SECOND DIVISION.

The second division comprises that section of the State lying south of Lake Ontario and the Mohawk river, and west of the Hudson. It contains forty-one counties. With the exception of a small portion occupying the south-eastern corner, this division belongs to the great paleozoic basin, which extends from the Appalachian range to the Rocky mountains, constituting the great part of North America.

Formed in the ocean's bed from the ruins of a wasted continent, and of a succession of vast deposits during alternate periods of elevation and subsidence, the whole series of stratified rocks that underlie this portion of the State, from the magnesian base of the lower silurian to the storm-worn cliffs of red sandstone that crown the highest peaks of the Catskill mountains, tell in unmistakable language the history of the material world through unnumbered ages of time. The several formations have a general geological designation as the Lower and Upper Silurian and Devonian systems, while the more detailed divisions, embracing many successive and distinct epochs of creation, have received a nomenclature in accordance with the localities where they are most clearly shown. There are twelve of these divisions, having an entire thickness in this State of 13,000 feet, but which it is not necessary for the purposes of this paper to enumerate. They are characterized by the circumstances of alternate elevation and depression under which they were formed. Sometimes in the bed of an open sea, and again in a land-locked basin of fresh water, while at other times the waters were limited to the area of a salt lake or great dead sea, whose bitter and saline waters were destitute of animal life, leaving, however, for future ages a deposit which is now one of the most productive sources of industry in the State. The salts of the rocks formed at this period are found in solution in waters issuing from the strata. The salt wells at Salina, in the county of Onondaga, are from 150 to 300 feet in depth, and at Syracuse, in the same county, they are between 250 and 350 feet deep. Thirty-five to forty-five gallons of this water afford, on evaporation, a bushel of salt; while it takes 350 gallons of sea-water to produce the same result. The salt-works of this section are on a large scale, and of great importance.

In consequence of the deep erosion of the river valleys, all of the geological formations are exposed to view in one place or another; while the two uppermost, that are known as the Chemung group and the Catskill group, predominate over all the surface of that portion of the State now under consideration. Through the central part of this division stretches, from east to west, an extensive plateau, rising to the west and south, but broken through by many transverse valleys, and descending by a series of terraces to Lake Ontario. In those transverse valleys lie embedded that wonderful chain of lakes which make the topography of this part of the State so remarkable.

## THE LINES OF ELEVATION.

The first and most easterly line of elevation in the second division is the extension into the easterly part of Rockland county of the Palisades or basaltic ridge from New Jersey along the west bank of the Hudson. This is a volcanic intrusion of trap rock through the red sandstone formation. The Highland range which is parallel to this, is composed of a great number of mountain ridges, occupying a belt of country twenty miles in width, extending through Rockland and Orange counties in a north-easterly direction to the Hudson, being the continuation of the Appalachian range. These are not long unbroken lines of elevation, but a succession of ridges, actually not in line with each other. The scenery in this region is grand and imposing. Numerous lakes are nestled in the hollows of the mountains. Vast deposits of iron ore are found throughout the range, as well as quarries of excellent granite.

Along the north-west portion of Orange county, the Blue Mountains extend in a high unbroken range, known as the Shawangunk Mountains, to the height of 2,000 feet. Its long unbroken crest is clothed with forests, which with the highly cultivated slopes form a pleasing and beautiful landscape. Between the Blue mountains and the Highlands lies the broad, undulating valley which is a part of the great valley of the United States, extending from Canada to Tennessee, known in New York as the valley of Lake Champlain and the Hudson river, in New Jersey as the Kittatiny valley, in Pennsylvania and Maryland as the Cumberland valley, in Virginia as the Shenandoah and Great valleys, and in Tennessee as the Valley of East Tennessee. It is everywhere noted for its rural beauty and agricultural wealth.

This is in fact the true extension of the valley of the Hudson. Through it vast, deep, and rapid torrents of water coming from the Champlain valley, have more than once passed southward to the sea, bearing in their currents much of the original surface which now forms the rich alluvial lands of the Atlantic border.

The next line of elevation to the west of the Blue ridge is composed of the sedimentary deposits which form the Catskill and Helderberg range of mountains. Unlike the Appalachian chain contiguous to it, which originated in the violent and convulsive throes of nature, and are upturned in wild confusion, the Catskills were formed in calm, untroubled waters, and with the exception of a gradual and gentle elevation of wide extent, these rocks have remained comparatively undisturbed, save by the erosive action of water, since their

first creation. The area covered by this old red sandstone formation was very much greater than it is now, probably extending over a large portion of the lower half of the State, but by glacial and aqueous action it has been removed, leaving for the uppermost rocks the shales and sandstones of the Chemung group.

#### THE GREAT PLATEAU.

The rocks of the Chemung group overlies the principal portion of the plateau of the southern tier of counties. In this wide region there is a total absence of those rich mineral deposits, which characterize the Archean rocks of the eastern portion of the State. The scenery of its lakes and its long river channels is varied and beautiful. Its valleys and its hill tops are fertile, and their sides are clothed with verdure which tells of a wealth in the soil, greater, perhaps, than the mines and the marbles of the eastern side. This is the granary of the State; the quiet peaceful homes of her yeomanry, where smiling fields and sequestered woodlands tell of cheerful toil, of domestic comfort, and of industry rewarded. Let us look for one moment at the results accomplished in this agricultural district.

#### NEW ENGLAND AND NEW YORK.

New England, the synonym of thrift and prosperity, contains 13,000,000 more acres of land than New York. The last census gives us the following figures. The six New England States have an area of 43,742,324 acres, New York has 30,080,000 acres.

	New England.	New York.
Acres of improved ground.....	11,997,540	15,627,206
Value of farms .....	585, 169,472	1, 272,359, 966
Farm implements and machinery...	22,553, 059	45,997,612
Value of live stock.....	100,521,907	175, 881, 712
Value of farm products .....	154,026,300	253,526,153
Bushels wheat.....	1,000,693	12,178,462
Bushels corn .....	7,347,666	16,462,825
Bushels oats.....	9,169, 504	35,293,625
Bushels rye .....	703,379	2, 478, 225
Bushels buckwheat.....	1,189,413	3,904,030
Bushels barley.....	1, 075, 059	7,434,621
Bushels grain ground.....	20,918,415	45,663,123
Value of products.....	26,474,435	60,237,220
Orchard products .....	3,819,206	8,247,417
Value of leather tanned.....	18,452, 970	26,988,320

	New England.	New York.
Lbs. butter.....	49,662,275	107,147,526
Gals. milk sold.....	21,044,175	1,135,771,919
Lbs. hops.....	987,409	17,558,681
Lbs. wool.....	6,643,863	10,599,225
Lbs. flax.....	19,741	3,670,818

These statistics are given not for the purpose of drawing an invidious comparison, but because it is only by such a comparison that the true extent of the resources of the State can be correctly understood or appreciated, and to enable us to see what the great western plateau of our State can produce, and no one will say that more than a fraction of our true resources have yet been developed.

### THE LAKE REGION.

The lake chain which occupies the center of the plateau, has always been a source of wonder and admiration to the student of natural history as well as to the lover of the beautiful in nature — the remarkable manner in which their united waters seek the same outlet into Lake Ontario; the part these waters are made to play in the grand system of internal communication; the strange freak of nature which has strung them together like a necklace of gems; the historical associations which surround them; the euphonious titles which recall the memories of the once powerful races of men who, vanishing forever from the earth, left nothing behind them save only their tribal appellations, inscribed upon the beautiful sheets of water they loved so well and around whose shores their lives were passed, all conspire to excite in the mind most varied emotions. Truly it is fitting that Lakes Seneca, Cayuga, Oneida and Onondaga should be united in a natural chain which shall forever symbolize the links of friendship that bound those gallant clans whose names they bear in bonds of amity that death alone could sever.

From the shores of these lakes the land slopes beautifully and evenly upward to the summit of the ridges which form their water sheds. The waters are clear and sparkling, and the whole lake region presents some of the finest landscapes in the country — Cayuga lake is thirty-eight miles long, Seneca lake thirty-five, Oneida twenty, Canandaigua eighteen, Chautauqua eighteen, Crooked lake fourteen, Owasco eleven, and Skaneateles thirteen. The origin of these lakes has been ascribed to glacial action. Naturalists, however, disagree as to the manner in which this action took place. On the supposition

that the land was elevated previous to the ice period, when a large portion of the continent was covered with an immense ice cap, it has been suggested that the valleys of the lakes were groves worn out by the abrasion of the advancing glacier. Again it is surmised that the valleys were formed under water by the movements of immense icebergs over a plastic surface. Agassiz infers that they are the result of cracks or fissures made in the contraction of the surface, by exposure to the heat of the atmosphere, on the elevation of the land from beneath the waters which at one time covered it. But the topographical position which they occupy with relation to each other, would seem to indicate an uniformity in the cause which has produced them that cannot be accounted for on any of the suppositions named. Assuming as established that the glacial movement was from the north-west to the south-east, the receding of the glacier would take the opposite direction. In its dissolution an immense volume of water would be discharged from the melting ice and would naturally descend in channels to the foot of the glacier, where being impinged with great force upon the earth, it would wear a deep channel which would be prolonged as the mass of ice receded.

Looking at the location of the lake valleys we can readily conceive the torrents of water discharging themselves from the receding glacier at the head of Cayuga and Seneca lakes, and a smaller one at the head of Crooked lake. This last lake is only fourteen miles long, but simultaneously with its termination, the size of the Seneca lake is materially increased, as if the stream that formed it had been enlarged by having added to it the one that was forming Crooked lake. Cayuga lake is also increased in volume. And the heads of a number of smaller lakes appear on the same line, indicating a great increase of temperature and a consequent increase in the number of torrents discharged from the melting and receding ice-field. All of these lakes, large and small, terminate on nearly the same line, where the erosion of the Mohawk valley begins, as if the glacier having reached that line, the volume of water caused by its rapid dissolution was discharged through that valley. In connection with this lake system, there is one feature which, although less striking than any other, and affording to the casual observer nothing to impress or interest, is nevertheless an object of deep concern to every citizen, not only in its economical aspects, but also in its influence upon the general welfare. I refer to the enormous area of saturated soil caused by the level character of the upper lake terrace. From Buffalo to Utica

there is very little of this terrace, ten miles wide and more than a hundred miles long, that is entirely free from the blighting influence of the immense swamp district that is there formed by the want of a sufficient outlet for the waters that accumulate on the surface. In times of excessive rain, all the lakes in consequence of their connection with each other, are under the influence of this excess of water. So that the cities of Auburn, Ithaca, Syracuse and Utica, as well as the smaller towns and villages, and all the inhabitants of this otherwise beautiful and highly favored region, are sufferers to a degree that is almost incredible. And all this for the want of an outlet for the superabundant waters, which can be readily and economically constructed.

### THE THIRD DIVISION.

The third division of the State, or that part lying north of the Mohawk, and east of the Champlain valley, is comprised almost entirely of the Adirondack region. This wild and picturesque mountain elevation is composed of rocks of the Archean or primitive period. It was an island while all the rest of the State was under the sea. Its magnificent and picturesque scenery makes it one of the most inviting spots in the world. Vast stores of mineral wealth and geological wonders abound on every side. The beauty and grandeur of the mountains, lakes and forests, have given it the name of the American Switzerland. Volumes could easily be written in the detailed description of this section. It embraces twelve of the largest counties, and occupies one-third of the area of the entire State. Although a large portion of it is totally unfit for cultivation, yet it is a region of great value. Its stores of iron are enormous. In one spot a large river has poured its torrents for ages over a dam formed entirely of native iron.

What is known as the Adirondack mountains, consists of several distinct and nearly parallel ranges, although the spurs which are thrown off from the different ridges, interlock each other in such a manner as to give the whole the appearance of a confused and irregular upheaval. The highest summits are attained in the county of Essex, which lies in the eastern part, bordering on Lake Champlain, the wildest portion of this wild region. Lofty peaks, immense mountain masses, broken crags and high precipices, deep gorges and narrow ravines, characterize the entire landscape. The several ranges have received so many different local names that it is difficult to describe them. Dix's Peak, the highest point of which is called the Bouquet



range, is 5,200 feet above tide, Mount Marcy, the highest point in the Clinton range, is 5,467 feet above tide, and the point of greatest elevation.

Mounts McMartin, McIntyre and San-da-no-na, belonging to the same range, are all upwards of 5,000 feet high; Mount Seward, of the Au Sable range, is 5,100 feet above tide. In the valleys between the mountain ranges, are several remarkable chains of lakes, generally long and narrow and bordered by steep mountain sides. Indian lake, Lake Pleasant, Schroon lake, St. Regis lake and others to the number of several hundred, form most interesting features in the landscape. The center of the region forms an irregular mountain plateau, filled with innumerable lakes and swamps, from which many of the rivers take their rise. Of late years the lakes and forests of the Adirondacks have become a popular resort for tourists and pleasure seekers, so that much that was previously unknown is becoming familiar; a railway penetrates to the heart of the iron district, and numerous summer hotels have been erected in different sections.

The chief value of this area to the people of the State consists in the vast natural reservoirs of water which the large and numerous lakes of the region constitute. The necessity for storing and husbanding the water supply of the Adirondacks as a means for increasing the volume of the Hudson river in times of drouth, have become so apparent, that the State has taken active steps to carry out the plans requisite to secure this object. The destruction of the forest along the watershed of that river, has naturally injured its navigation, and the remedy proposed for this evil cannot be too soon or too fully accomplished.

It is impossible in a brief paper to give any thing more than a mere outline of the remarkable resources of this State. To the early recognition of their importance and value is due the pre-eminent position it now occupies, and on their continued development this pre-eminence depends.

#### INTERNAL IMPROVEMENTS.

In the last century, at the close of the war of the revolution, General Washington's anxious solicitude for the welfare of the country led him to a thoughtful consideration of the means by which its newly-formed bonds could be more firmly secured. He saw the necessity of uniting the east and west by artificial means of communication and by the improvement of the natural channels. To this end he made a personal and careful examination of the topography of the

State of New York. Having been an engineer, he was competent to understand the relations which topography bore to transportation. And, in a letter to the Marquis of Castellux, written at the time, he says: "I have lately made a tour through the lakes, George and Champlain, as far as Crown Point — then returning to Schenectady, I proceeded up the Mohawk river to Fort Schuyler, crossed over to Wood creek, which empties into the Oneida lake, and affords the water connection with Ontario. I then traversed the country to the eastern banks of the Susquehanna, and viewed the Lake Otsego and the portage between that lake and the Mohawk river at Canajoharie. Prompted by these actual observations I could not help taking a more contemplative and extensive view of the vast inland navigation of the United States, and could not but be struck with the immense diffusion and importance of it, and with the goodness of that Providence who has dealt His favors to us with so profuse a hand. Would to God we may have wisdom enough to improve them."

The natural advantages thus graphically outlined by General Washington, became a subject of careful investigation under the authority of the State, resulting in the successful execution of those plans of internal improvement, which are at once the pride and glory of the State. These public works have, in their ultimate results, exceeded the most sanguine anticipations of those statesmen, to whose wisdom and foresight their conception is due, and to them, the city of New York is chiefly indebted for its pre-eminence as a commercial city. The Erie canal is a monument of skill and enterprise, of which the citizens of the State may be justly proud. Its construction was authorized in 1817, and it was completed in 1825, at a cost of \$7,143,789.86. Its completion was an era not only in the history of the State, but also an era in the history of the country, for by it, a commercial highway was opened to the great west, along which has moved the silent but resistless tide of immigration, which has spread itself through the valley of the Mississippi, creating States, erecting cities, and developing the wonderful resources of a vast country, which but yesterday was a wilderness in the undisputed possession of savages and wild beasts. Every five years adds more than a million recruits to the great industrial armies, which, while creating homes for themselves, return here the product of their labor, and thus pay constant tribute to the commercial emporium. Thus the wonderful growth of the city of New York has become the exponent of the rise and progress of the Republic, while its prosperity dates from the completion of the Erie canal.

There are many yet living who heard the exulting shouts that went up from the Atlantic to the lakes, when on the 26th day of October, 1825, the signal guns, placed at intervals for five hundred and thirteen miles from Buffalo to New York, announced to listening thousands, that the first boat from Lake Erie, had entered the western canal, to be conveyed to the ocean; and who saw also that triumphal procession as it moved through the streets of the city, in which all the trades and industries vied with each other in testifying, in the most appropriate manner, their joy at the completion of a work, to them the dawn of a new prosperity.

It was a coronation day! for Industry was that day crowned King in the Metropolis of free America. Not Westminster, nor Rheims, nor pagan Rome, ever witnessed so grand a scene. There were no gilded chariots, nor purple robes, but simply a long line of artisans working at their trades, exhibiting their joy by asserting in their pride of manhood the dignity of labor. None who were present can ever forget the simple grandeur of the occasion. Just half a century has passed since that day of exultation, and the solemn questions have been asked of the citizens of the State and city — Have we been true to the high trust which was that day imposed upon us? Has the gift that day bequeathed to posterity been kept untarnished, to be handed down in its purity to future generations? If official corruption and private greed have impaired the value of this great public boon and blessing, let us see to it, that such a stain be thoroughly erased from the otherwise fair escutcheon of our State.

Besides the Erie canal there are twelve so-called lateral canals, some of which were constructed to supply the main canal with water. The total cost of all the canals was \$64,710,836.94. Most of the lateral canals were built to open up the forest lands of the State, and as the forests have been in a great measure removed, these canals have ceased to be a source of revenue, on the contrary, are a tax upon the State. It is proposed to dispose of them, or discontinue them as State works, and to concentrate the resources and energies of the government upon the maintenance and improvement of the main line. This is a measure of such clear and just policy that there should be no delay or hesitation in adopting it. For so long as the revenues of the trunk line are diverted to the useless maintenance of the lateral lines, so long will the commerce of the State be taxed by high rates of transportation. The effects upon the grain trade are too apparent to need discussion, and the permanent diversion of this trade

to other channels will be the inevitable consequence of a persistence in the present course.

Time will not permit me to dwell further upon the interesting subject of the resources of the State of New York. This brief review is a mere indication of what they are.

I am sure, however, that no citizen can contemplate its wonderful advantages and its great prosperity without a feeling of deep pride in the Present — a profound respect and veneration for those who guided its councils in the Past — and a strong hope and fervent faith in the Future.

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At the close of the address, which commanded the close attention of the large audience to the end, the Rev. William Adams, D. D., moved that the thanks of the Society be tendered to General Viele, and that a copy of the paper be requested for publication. Dr. Adams stated that the subject was one of great interest to every citizen, and that he had felt deeply impressed by the exhibit which had been presented of the resources of the State. And referring to the suggestion which had been made by a member of the Society, that the governments of Europe were more liberal to science than the United States, he expressed the belief, that through the graduates of the Military Academy at West Point, of which the speaker of the evening was one, the United States had conferred more benefit on the cause of science than any appropriation of money could accomplish.

# THE INFLUENCE OF THE PHYSICAL GEOGRAPHY OF PALESTINE ON HEBREW THOUGHT.

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By PROFESSOR FELIX ADLER.

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MR. PRESIDENT, FELLOWS OF THE SOCIETY, LADIES AND GENTLEMEN.—If you will follow me, in imagination, for a moment, to the banks of the sacred Ganges, you will behold before you a teeming soil, a luxuriant vegetation, birds of bright plumage, diversified with a thousand varying hues, grand, stately trees, with creepers curiously interlaced between them, that form a net-work of dense, impenetrable jungle. It is the land of the mystic lotus and the banyan; a land of dreams and fantasies. An easy thing it is to trace in the physical geography of this country many of those striking peculiarities that mark the political and religious history of the Indian nations.

The indolence of the people was the result partly of the prodigal bounty of nature, which seems to render the labor of human hands almost needless, partly of the sultry heats of summer, and the incessant rains of the wintry season, that combine to make exertion of every kind inexpressibly arduous.

The forest life of the Hindoo sages was the natural resource of contemplative spirits who sought protection from the fierceness of the noonday sun in the seclusion of their sylvan retreats; while the influence of a tropical environment is still more clearly visible in that passiveness, that complete self-absorption, that longing for absolute repose, which distinguishes the religious systems of the Brahmins and Buddhists alike from any other that the world has seen. The highest aim of the Hindoo religions is rest. After endless and painful resurrections, the soul sinks back into the Brahma whence it arose, or is merged into the shoreless ocean of Buddha's Nirvana.

The supreme boon which the religions of the vigorous, life-loving nations of the western world hold out as the reward of virtue is immortality, is the continuance of conscious existence through the boundless eons of futurity.

The supreme solace of the devout Hindoo is the hope of *annihilation*,

of unbroken rest — of a long, long sleep from which there shall be no awakening.

It is the enervating effect of a sultry climate which has given character to all their thought.

If we turn from India to the valley of the Nile, the influence of its physical complexion upon the mind of its inhabitants will be found no less impressive. The placid serenity of the sky, the unbroken regularity of the river's rise and fall, the conservatism of nature, in a word, to which we owe the existence of the pyramids and palaces at the present day — all these contributed to inspire the Egyptian people with an overweening trust in the stability of earthly affairs, and taught them to confide their works, their names, nay, their very bodies to the keeping of future ages, without a passing doubt of their continued preservation.

The advantages which European nations have derived from the blessings that nature showered upon their much-favored continent are too apparent to stand in need of extended comment. In the temperate regions of Europe the prerequisites for the development of a high order of civilization are indeed united in an unusual and felicitous constellation.

Here the soil demands the fertilizing labor of man; while the yield which he receives in return is sufficient to incite and reward his industry.

Regular habits are thus encouraged, and a spirit of manly self-reliance and independence arises, unknown to eastern nations. Europe is free from those sudden and terrible visitations that have so often nipped the opening buds of culture in the tropical regions. Production is continually enlarged; and society is at length in a position to spare its finer intellects, and to set them apart for discovery and invention, to open the highways of science, and to embellish the pleasure-grounds of art.

Even a casual survey of some of the most remarkable quarters of the ancient world has thus revealed a certain correspondence between the physical environment and the intellectual development of nations. It may, therefore, be reasonably presumed that closer scrutiny of any particular country will result in the discovery of a still more intimate connection between the material and spiritual phenomena that transpired in its midst.

I propose to undertake an inquiry of this kind this evening. I propose to examine some of the leading peculiarities of Palestine's

geography, such as the relative distribution of mountain and valley, its geographical formation, the climatic conditions to which it is subject, with a view to determining the influence they exerted on Hebrew thought.

In attempting so difficult a task, I am conscious of the grave difficulties that present themselves at the very threshold of my undertaking. As a rule historians have not hitherto availed themselves, to any great extent, of the aid which physical geography proffers for the solution of historical problems.

It is customary in general to treat this valuable auxiliary with a degree of indifference bordering on contempt. While more particularly in the department of history, which I have made my specialty, and which embraces the record of the Old Testament within its field of research, powerful religious scruples have combined to strengthen the general prejudice, it being feared that the rude hand of science might attempt to violate the sacredness of the Hebrew writings. I need not say that these fears are groundless. Truth has no reason to shun inquiry. While deceit may veil its doubtful beginnings in the twilight vagueness of mystery, we must insist that the truths of the Bible dare welcome the light, and will only gain in grandeur and beauty as the conditions under which they arose are more thoroughly understood. I lay stress upon these last words, "the conditions under which they arose," in order to guard, at the outset, against a misconception which, if permitted to arise unchecked, would seriously embarrass our further progress.

In dealing with the influence of material conditions on the development of thought, we do not for a moment entertain the preposterous idea of derogating from the integrity and dignity of mind. Physical conditions are the occasion, by no means the cause, of intellectual action; as the bud will not open without sunlight, but the sunlight is not, therefore, the cause of the flower. The mind is a self-acting agent, obeying, so far as we can tell, laws peculiar to itself; yet the mind is "many-sided," and depends largely on external forces for the direction in which its powers shall be developed — whether, for instance, the imagination is to predominate, as under southern skies, or the purely reasoning faculties, as in the temperate regions of the north. The question of the ultimate constitution of soul is left totally unaffected by the species of discussion upon which we are now about to enter.

The novelty of our undertaking, while it may lend it a certain charm in the eyes of the student, enhances the difficulty of presenting

it fairly to the criticism of an audience. The limits of an evening's discourse will of themselves preclude our entering upon many points of vital importance. Others must be passed over in complete silence. I shall content myself, therefore, with offering an outline merely of the conclusions I have arrived at in the course of my investigations, and must rely on your patience to indulge the defects that are inseparable from every tentative effort in a new direction. If our main assumption is correct, we must expect to find the country of the Hebrews a peculiar land, even as Israel was a peculiar people. Let us begin by taking a general survey of its relative position to the surrounding territories.

Palestine is a land set apart by itself, condemned to solitude by barriers which nature herself has set up, and which proved insurmountable to ancient people.

On its northern frontier, it is approached by the great mountain chains of Lebanon and Anti-Lebanon, between which the narrow valley of Cœle-Syria opens a highway of communication with the banks of the Euphrates for the caravan or the conqueror. Branching off from the roots of Anti-Lebanon two great ranges extend, in parallel lines, through the whole length of the sacred land, and are continued far into the ocean of sand that bounds its southern border. It is the western range that once embraced the kingdoms of Israel and Judah, and with which alone, therefore, we are concerned here. This range is shut in on the north by the higher mountains of Aram, on the south by the waste land of Idumea and the desert; on the west, by the Mediterranean sea; on the east, by the deep gorge of the Jordan valley. It is thus hemmed in on every side, and free intercourse with the surrounding countries is rendered forever impossible. Its inhabitants, isolated from their fellow-men, are thrown entirely upon their own resources, and thus acquire a certain hardness of character, an aristocratic pride of race, a strong sense of superiority which continually challenges the hatred of mankind, and at the same time lends them such coherency that all the world's hate is powerless to crush them. It is certainly a remarkable fact that even those physical features which we are accustomed to regard as the natural highways of human intercourse have, in the case of this wonderful land, tended rather to retard than to foster the spirit of enterprise and the desire for communication. The sea has elsewhere proved the great carrier of the commerce of nations and thus bringing them nearer together, has often washed out their mutual aversions and animosities.



But the waters of the Mediterranean are only an additional bulwark to the solitude of Palestine. Along that whole coast, from Gaza to the "Ladder of the Tyrians," there is barely a single sheltered harbor which could serve as a safe anchorage for shipping. A great river is elsewhere considered the natural bond of connection between the peoples that inhabit its banks, permitting them to travel with ease from their own to other lands, opening the way for an interchange of their several products, encouraging the arts and enlivening trade. But observe how the Jordan, the one great river which Palestine possesses, disappoints these expectations; nay, how, by a combination of circumstances peculiar to itself, it tends to produce effects the very opposite of those we looked for. The Jordan and the deep-cut valley through which it runs, presents, on purely geological grounds, one of the most interesting phenomena on the face of the globe. Rising on the slopes of Mt. Hermon, the outmost sentinel of Anti-Lebanon, the river passes through the Lake of Merom, high up in the north of the Holy Land, descends three hundred feet and reaches the Lake of Tiberias whose name has been rendered memorable by the scenes of the New Testament enacted on its shores, and by the associations connecting it with the events of the later history of the Jews. A bright, sunny lake, abounding in fishes, on whose western border a rich vegetation still speaks of plenty, and the lily of the valley decked in its scarlet colors which Solomon's royal robes could not rival, and the endless voices of the mellifluous singing birds, still tell of beauty and of joy. Thence, still flowing downward, the Jordan passes into a wild rocky region, forcing its way between high cliffs with steep precipitous descents on either side, painfully twisting through sixty miles of ceaseless windings, and, at last, after leaping over twenty-seven rapids, and having accomplished a further descent of 1,000 feet, it reaches the steaming cauldron of the Dead Sea. For a while it struggles to maintain its identity as the turbid streak in the green surface of the sea indicates. But it is in vain. In those heavy nauseous waters where all life perishes, it too dies; and its stream is mingled with the salt waves of the lake of death. This lake is situated at a depth of 1,300 feet below the level of the Mediterranean, being the most depressed sheet of water on the surface of the earth. Along the bare shores that encircle it there reigns, even in the month of January, a heat so intense as to make life in its vicinity almost intolerable to the European. Bits of pure sulphur and nitre lie around, and everywhere the eye meets the signs

of nature's destructive agencies. A deep haze produced by the rapid evaporation of the water settles over the river's grave, and the low ridge of rock salt, connected by the legend with the story of Lot's escape, that marks the southern extremity of the lake, is the last limit to which the waters of the Jordan can be supposed to penetrate. Thus this wonderful river, far from leading outward to communion with the external world, is itself absorbed before it can depart from the boundaries of Palestine. And with the ravines that line its sides, with the barren waste, "the desert of the Jordan," that marks its course on either hand, with the sultry climate that prevails in its neighborhood, forms but a new barrier to shut in the eastern border of the land of the Hebrews.

On the high hills of Moab that overlook the basin of the Dead Sea and take in in one broad view a great portion of the promised land, Balaam, the seer from the East, stood of old to curse the outspread hosts of Israel. And as he gazed from the top of rocks and lofty heights on the future home of Hebrew tribes, he exclaimed—the first words that escaped his lips:—"Behold the people that dwell in solitude." It is the same expression which involuntarily occurs to every traveler, the same striking feature that first suggests itself to our notice. Loneliness, retirement from the commerce of the world, a secluded land—an exclusive people! It is hardly possible to overestimate the influence of this peculiarity of the country on Israelitish history. Let us remember that however grateful the amenities of social intercourse may be, there arises in all intimate connection with our fellows a tendency toward uniformity which acts as a check upon the development of distinct individual effort. Whenever, therefore, an extraordinary mind, a genius of unique powers, appears among men, he finds solitude to be the essential condition for the growth and perfection of his separate self. And thus the genius of the Hebrew people needed solitude, for their mission was to break loose from the traditions of the world and to produce a system of religious thought at variance with all the collected wisdom and the cherished belief of antiquity. Indeed, within the borders of Palestine itself, a distinction is to be made between the different districts of the country, in proportion as their position was more or less isolated, a distinction with which the unequal distribution of monotheism over different portions of the Holy Land will be found exactly to accord. In the south, the kingdom of Judah, this feature is most prominent, in the middle region of Samaria, the kingdom of Israel,

it is considerably less so, while in the extreme north it is almost entirely wanting. Correspondingly the stronghold of monotheism was among the hills of Judea, its authority greatly limited, if it was ever to any considerable degree recognized, which may be doubted, in Samaria, while it was utterly weak and uncertain in Galilee. Let us dwell upon this point a moment longer, though its full significance can only appear in the third and last division of our discourse.

The size of Palestine is, as in the case of Greece, hardly commensurate with its importance. "It is not considered among the nations." The whole country from Dan to Beersheba is only about 180 miles in length, fifty in breadth. And yet, within this small territory, what diversity of character! Even vegetation assumes the most various forms. In the tropical climate of the Jordan gorge flourish the palm tree and the oleander; the oak and the terebinth at Hebron and Shechem. The snows are on Hermon, the cool breezes on Mount Ephraim, the sultry torpor of an Egyptian summer upon the lake Asphaltitis.

The realm of Judah is a mountainous district, its people a race of mountaineers. Jerusalem is situated at an elevation of 2,600 feet above the Mediterranean, and of about 4,000 feet above the basin of the Dead Sea. The hills are of bare limestone rock, rising in concentric circles, and everywhere displaying the remains of an ancient terrace culture. There are no plains to be found here, but only narrow valleys, and wild, precipitous ravines, whose craggy sides are filled with innumerable subterranean caverns of unknown depth and labyrinthic structure. The aspect of the country is stern and monotonous. There is nothing to please the eye but dull, tedious sameness on all sides. It may be that the influence of the neighboring desert, and its hot winds is traceable in this general bareness of the southern kingdom. Standing on one of the many conical heights whose frequency it has been well observed gave rise to the prominent cult of "high places" among the ancient Hebrews, the eye of the traveler beholds in the east the steep cliffs that overhang the forlorn waters of the sea of death, and further off, the long line of the blue mountains of Moab; in the west the wide expanse of the Mediterranean, glittering, perhaps, in the last rays of the setting sun; around the dizzy precipices, the mysterious caves, the somber, silent hills. This is a land where the thoughts of men would dwell upon the Infinite in its gravest, grandest, gloomiest forms. The imagination fired by the strong, rich wine that grows around, winged its way

upward on the wild strains of passionate music that re-echoed in these vales. It burst forth in eloquent song. It gave birth to the majestic rhythmic measures of the psalms and hymns of Scripture, and filled them with the symbols of its surroundings—the eagle and his eyry; the rock that cannot be moved, the roaring torrent, the voices of the thunder, and the glare of the long-flashing lightning. But no gorgeous pantheon could rise here, no plastic molding of the form, no worship of the beautiful. There is a deep tinge of the solemn in the character of the Judeans. In their early worship they inclined to the dark rather than the joyful of the two forms of religion which divided the Semitic cults between them. Their god strikes dead whoever ventures to approach him, his presence brings pestilence, even to his own chosen people he speaks amid the din and terror of the tempest.

As we approach the central region, commonly known as Samaria, the scene gradually changes. Even the hills, it is conjectured from their closer proximity to the sea and its moist winds, assume a more genial aspect, their slopes being covered with timber, frequently to the very summit. The main feature that distinguishes the land of the ten tribes from its southern neighbor is the occurrence of valleys and plains.

These break through the central mass of hills which we have previously described in general terms as the abode of the Hebrews, and thus introduce a new element of culture into Israelitish history. "Cut out as with a knife" from the mountains of Ephraim and Galilee we behold besides numerous sunny valleys the great historic plain of Esdraelon that opens a level road between the seashore and the Jordan. Here in the land of the olive and the palm Joseph "the prince of his brethren" dwelt by the fountain, delighted in the plenty of his kine, received the choice things of the heavens above and the depths below, and gathered the rich blessings of Jehovah on his head. It was indeed a land which fully answers to the inspired description of the dying patriarch. The pale, blue mist that appears in the vale of Schechem, the ancient seat of the northern kings, and lends such beauty and softness to the landscape is seen nowhere else throughout Palestine. Grey groves of olives delight the eye, and fields of waving wheat and barley present an appearance of ease and affluence that we look for in vain in the rocky regions of Judea. Jerusalem was raised upon a high table-land thousands of feet above the ocean, but the capital cities of Samaria were built upon the plain, or at least upon comparatively insignificant elevations.

In Judea, life was concentrated, intense, self-sufficient, utterly secluded. In Samaria it was expansive, open to external influence enlivened by intercourse with the surrounding nations. Joseph delighted in his vehicles, of which Judah was entirely destitute. The road to Egypt was open and must have been frequently traveled while the bond of connection with the Phœnicians was close and firm. Even the dialect of the Samaritan land seems to have been more nearly allied to the language of the heathen Syrians, if we are to trust the researches of Ewald, Renan and others. In the easier circumstances attending life in the plains the repellant sternness of Judea was toned down, if not entirely lost, and the more sensuous existence of the people led them to take a more sensuous view, as of all other things, so also of religion. Here Jehovah was worshiped, under the form of the calf, down to the very day of Samaria's destruction. The Baal came in by way of Phœnicia, the Apis and Mnevis were imported by Jeroboam from Egypt. It is important to notice in this connection that the story of Aaron and the golden calf is typical of the religious changes which Jeroboam introduced in Israel. The two sons of Aaron who typify the early form of sensuous worship were called Nadab and Abihu. They, not their two brothers who became the bearers of a purer monotheism, ascended with their father to the top of the mountain, where it is distinctly stated that they actually saw Jehovah and offered sacrifices of calves. They were destroyed in the sanctuary for offering *strange fire* to their God. The two sons of Jeroboam were likewise called Nadab and Abihu, names which we hardly meet with again in the whole range of the sacred Scriptures, and both perished by a premature death. The words which Jeroboam used in inaugurating the worship of the calf are literally the same as those with which Aaron opened the riotous orgies of the people around their golden idol in the desert. To confirm these indications we are informed in the book of Judges that a line of priests actually existed at Bethel, the place where Jeroboam erected the calf, who traced their descent from Aaron and who probably remained there till a revolution, noticed in Chronicles, compelled them to seek refuge in Judea.

Turning now to the third and northernmost division of Palestine we behold in Galilee by far the loveliest district of the Holy Land. High, green, grassy valleys, groves of sycamores, villages picturesquely grouped, the forms of the mountains diversified, the lakes bright and blue! A land of plenty and of peace. But in the history of ancient

Israel it played no part. The inhabitants were a simple people, whose wants were amply satisfied by the free gifts of nature, whose energies were never called forth by hard struggles against a stubborn soil and warlike borderers. They lived in tranquil submission, "dipping their feet in soil," indeed, but also bearing the burdens of their heathen masters like the ass. Their country was full of foreigners, with whom they intermarried, and whose customs and religion they no doubt to a large extent adopted. No patriarch ever built an altar in their territory to mark the spot of future shrines, no prophet rose of old in their midst. It was "Galilee of the Gentiles."

Reviewing the regions we have passed over, the whole country now appears to us like an enlargement of its own most revered sanctuary. Judah is the high priest alone in his office, alone in the Holy of Holies, where no form is seen save the cherubim over the pledge of the covenant. The sons of Samaria are priests in the outer shrine, who worship in lighted hall with table spread and amid the odor of perfumes, the signs and symbols of earthly things, that appeal to the senses. But Galilee is the open courtyard, the great gateway to the world of strangers without, around which the empires of the ancient time, Syria, Babylon, Media and the Isles of the West were gathered, and through which the name of Jehovah that resounded from the inmost sanctuary was borne forth at last as a gospel to all nations.

I should here remark that the sources on which we rely for these descriptions, are mainly the excellent works of Dr. Robinson, the Report of the U. S. Expedition under the command of Lieut. Lynch, the charming book of Dean Stanley, entitled "Sinai and Palestine," Ritter's "Erdkunde," Munk's "Palestine," Neubauer's "Etudes Talmudiques," Schwarz's "Das Heilige Land." In view of the impression which generally prevails abroad that Americans, as a people, are exclusively devoted to the pursuit of gain, it is gratifying to report that the labors of our own countrymen in this department of science at least, far surpass anything that has been done by foreigners.

The second characteristic feature of Palestine's physical geography now demands our attention.

Instructed by the achievements of science, we of to-day are accustomed to regard with satisfaction the reduction of phenomena seemingly the most anomalous to fundamental principle. We see in the falling of a leaf, in the form of a dewdrop, the manifestations of inexorable law. The mightiest as well as the most insignificant phe-

nomena we know, are governed by agencies from whose chosen path there is no departure. Nay, it is this very cosmos, this orderly arrangement which meets us everywhere, that is most apt to kindle our fancy and elicit our admiration. But matters were different in a previous and lower stage of human development. At that time men were children in their habits of thought, and like children, they regarded the natural course of events as a matter of course, their attention being fixed only by whatever startled or alarmed them. Such occurrences, indeed, over which they had no control, they were ready to ascribe to the working of a higher power, and their awe went out toward the beings in whose hands they conceived their destinies to repose for weal or woe. Where climatic or other conditions were conducive to the formation of regular habits of life, the tendency to refer the natural to the supernatural was weakened. Where men were allowed to exert their skill upon production, they acquired confidence in their own energies, and as they beheld their work grow through their own efforts, security lulled them into comparative indifference with regard to the mysterious interference of powers above them. But, among those nations where disturbing causes were both frequent and sudden, the opposite took place. In our own age we may see this contrast exemplified among the so-called lower classes if we compare the settled habits and consequent callousness of the artisans in our large towns with the uneasy superstitions of sailors and miners. To apply these remarks to the case before us, we find the conditions of existence in Palestine to be extremely precarious and unstable. In the first place, the inhabitants are entirely dependent on the rain, not only for comfort, but even for the bare means of subsistence. Twice in the year (late in October and in March) the showers are expected to descend. If they come in good season the cisterns are filled, the water-courses replenished, the dry soil greedily sucks in the welcome moisture. Soon the fields are covered with abundant verdure and plenty reigns. But woe if they fail, even for a few weeks. Then vegetation withers, the soil is baked and burnt, the beasts droop, and men perish amid all the agonies of thirst and the horrors of starvation. Thus, year by year, the inhabitants of this land were made to feel the uncertain tenure of their being. Death was ever before the gate, and life ever a gift bestowed or withheld at the pleasure of a mightier will. As the book of Deuteronomy has it — your land is not like that of Egypt which is watered by the regular

inundations of the Nile. But it is a land upon which the eyes of Jehovah must rest from the beginning of the year to its end. If you obey him, he will give you rain, if you rebel, he will destroy you by refusing it. And elsewhere it is said that Jehovah will send down rain on one city, and restrain it from another, as a punishment or a reward. The general feeling of insecurity thus produced was heightened by the occurrence of destructive earthquakes. Deep gashes opened in the earth and swallowed up what it had required, perhaps, the labor of ages to produce. The dire plague of the locust, too, which Joel has painted in such vivid colors, contributed in the same direction. They are described as coming with ranks unbroken, a silent host. The sky is darkened by their numbers, the sun is hid. The land is as the garden of Eden before them, as the track of war in their rear. On all sides the fears of the people were thus alarmed, and each fresh experience served only to confirm them in the conviction of their utter dependence on superhuman agencies. These sudden eruptions that broke the even course of events, these seemingly capricious inroads on the laws of natural sequences were regarded as manifestations of the Divine Power through which it was pleased to make its omnipotence felt. Hence it came to pass that when men desired to learn the wishes of the Deity for the regulation of their own particular affairs, they were ready to consider any occurrence that seemed *at variance with the laws of nature* as an indication of his pleasure; and such, indeed, was the opinion of the ancient Hebrews. Gideon, being uncertain whether to attack the Midianites, places a fleece of wool on the ground at night saying if it be covered with dew in the morning, and the ground about it perfectly dry, it is Jehovah's will that I proceed. This occurs as foreseen. To make sure, he reverses the experiment the next night, and then gives battle, confident of victory. Elijah divides the waters of Jordan with his mantle, and thereby proves his Divine commission. For the same purpose Elisha causes an iron ax to swim on the top of the water, and brings it about that a few loaves feed a great multitude, so that they are sated and even leave over. As late as the days of Isaiah, the shadow on the sun-dial suddenly moves backward ten degrees, and this is received as a sign that the prophet's words are divinely sanctioned.

In all these instances the standard by which the divine signification of an event is determined does not consist merely in its fortuitous occurrence, as in the case of omens, auguries and sorcery in general,



but in the fact that it happens *in direct contradiction* to the supposed order of the natural world. Surely there is nothing in this insight that can give us just cause for annoyance. We have long been taught to consider the form in which the Bible clothes its truths as adapted to the needs and understanding of the people to whom they were addressed. The Bible itself frequently questions the faith of those who are forever demanding signs and do not perceive that the value of the prophet's message lies in its own intrinsic worth. The wine is not less excellent because it is served in vessels of earth. And of us who examine the vessels it must not be taken amiss if we analyze the terrestrial matter of which they are composed.

We approach the last and most important division of our subject. The influence of Palestine's physical geography on the domestic and religious life of the Hebrew. To discuss this question properly, it will be necessary to fix those two points on which the whole argument hinges.

First. What was the character of domestic life among the Hebrews before they settled in Palestine?

Secondly. What was the nature of those modifying influences to which they became subject after their settlement?

As the records upon which we must rely are few and fragmentary, it will be necessary to supplement our investigation by the help of comparative research. The Hebrews were originally a nomadic people, akin in customs, manners, and language to their brother Semites, the Arab Bedouins. The latter have scarcely departed from their primitive habits even at the present day. They led a roving, restless life, "their hand against all men, the hand of all against them," without a permanent abode, or the means of perpetuating the fruits of their toil, compelled to contend with their neighbors for the scanty pasture lands, and entirely dependent on the number of their warriors for success in the dire struggle for existence.

Hence it came about that the birth of a boy, promising, as it did, an increase to the strength of the organization, became the occasion for feasting and noisy demonstration of joy. Hence arose that supreme desire of male offspring, which is one of the most characteristic features of Arabian life. "Sweeter than a boy" is the Arab proverb that expresses the height of excellence. "May your union be tranquil and firm; may it be blessed with sons and with daughters" was the benediction announced over the newly-wedded pair.

Again, the Arab is a free-lance, possessing the chivalrous instincts, the virtues and vices, that arise in the pursuit of military glory. He seeks a foeman worthy of his steel. He is ever ready to resist a counter-claim; but is kind and generous to those whose very weakness is a confession of his strength. The stranger who enters his tent is as safe as in his mother's arms. He will die for the females of his tribe who look to him for protection. On this account, notwithstanding their contempt for daughters, the sons of the desert accorded a degree of respect to their women hardly to be looked for in their semi-barbarous condition. And claims to respect would naturally be urged by those on whom the chance of increasing the tribe depended. A woman who had given birth to many sons was distinguished by an appellation of honor. Similar traits, in the relics of the nomadic period of their history we are at no loss to discover among the ancient Hebrews. The high value they set on male offspring is well known, and is illustrated not only by the story of Abraham and Isaac, Elkanah and Hannah, the parents of Samuel, but throughout the legal enactments and prophetic writing of the Old Testament. The comparatively independent position of women, too, appears in the achievements of the heroine Deborah, in the deference paid to women's counsels by the patriarchs, in the quiet submission of King Saul to the bitter taunt of the women of Israel. But it would, indeed, be over hasty to leap from these premises to the conclusion that the family, as at present constituted, was in the earliest times known among the Hebrews; or to make the still broader assertion, as is frequently done by the uninformed, that it was, in its rudiments at least, at all times a possession of the human race. It was nothing of the kind, not even in its rudiments. However repugnant it may be to our sentiments, we must face the plain fact firmly, that the idea of a pure home, in our sense, was the product of a very long and tedious process of historical evolution. Beyond the point where what may be termed a family first emerged in the progress of our race, there lies a vast obscure period, filled with crude and sometimes hideous forms of social intercourse, which the veil of oblivion has only partially shrouded from our knowledge. If it should appear in the course of these investigations that the Hebrews themselves shared in some of those lower forms, this will not diminish our admiration for the moral power developed in their midst; on the contrary, our gratitude towards this people will rather be deepened, when we learn that to their noble and strenuous efforts we owe our present elevation to a higher plane.

We shall now cast a brief glance on some of the most important stages through which the institution of domestic life has passed among mankind, in order to discover what ruder forms the Hebrews held in common with other races, and, later on, to determine the influence of physical conditions in modifying and exalting their conceptions of the family.

On consulting the works of those authors who have given the subject the most exhaustive study, McLennan, Morgan, Sir J. Lubbock, Sir Henry Maine, Bastian and others, we find them all agreed in the statement that the primitive condition of domestic life among the human species was hetairism, promiscuity, or what may by courtesy be called communal marriage. At that time the individual was related solely to the group which contained him and the relations between the sexes, as Lubbock has it, were ordered "on the good old plan, that he should take who has the power, and he should keep who can." This state of things still exists among the Ansarians, the Keiaz, the Eimauk, the Koryaks, the Mpongme, the Puharies of the Himalayas, etc. Our baser nature was still all but supreme, and it took a long time to loosen its hold.

At a somewhat later epoch (it is impossible at present to determine the exact order in which the different forms succeeded each other), the main body was subdivided into various minor groups, in which the former rule of promiscuity continued to hold good; but its application was confined to the members within the group, all others being excluded. In connection with this form, and explained by it, we may notice the curious custom of tracing descent in the female line which still prevails among so many of the barbarous tribes. In the communities I have described it is impossible to trace the father's blood. The connection between mother and child, on the other hand, is assured by nature, and strengthened by innumerable ties. On this account, the idea of kinship could be extended with certainty to those only who are related on the mother's side. The sons and daughters, the brothers and sisters, of the mother belong together, and are united by mutual affections of the most cordial character. The bond between the husbands and the children has been, and still is in numerous instances, extremely loose. Considering the degraded condition in which women are generally held among the ruder races, it is impossible to conceive that they should have obtained this preference above the males in the primitive systems of consanguinity on any ground other than that of necessity. Among the Hebrews we have ample

proof that descent was at one time traced in the female line, and hence that at some period of their history domestic intercourse among them must have been based on the communal principle. Accounts of similar arrangements have been transmitted to us concerning their kinsmen, the Arabs. Far from casting a shadow on the sacred history, however, it will presently appear that this new insight serves rather to remove what has by many been considered a grave blemish in the character of some of the most revered personages of Holy Writ. Thus Abraham marries his own sister, by the same father though not by the same mother; Nahor espouses his neice; Amram, the father of Moses and Aaron, his aunt; while David is believed to have considered the union of two of his children, Tamar and Amnon, by different wives, unobjectionable. Most of these alliances, must, indeed, be condemned as grossly immoral, unless we recollect that descent was reckoned in the female lines; that relationship through the father was uncertain, was, indeed, hardly relationship at all, and that persons so connected might fairly be considered sufficiently remote from each other to render intermarriage at least permissible. A still later form, and, we conceive, a signal advance upon the ones we have been considering, was polyandry. This system still prevails throughout Tibet, in parts of India, in Ceylon, it is said on the Aleutian Islands, and among the Saporagian Cossacks of Russia, thus embracing many millions of human beings within its limits. McLennan calls that the "higher polyandry," where the husbands are all brothers. In Tibet, Turner assures us that he himself saw five brothers living very happily with one female, under the same connubial compact. The elder brother chooses the wife. In such a communal home all my father's brothers' children are my brothers and sisters, all my father's brothers are my fathers, or little fathers, as they are sometimes called. The relations of him whom we now term uncle to brothers' children are far more intimate, and his obligations toward them more direct than in our system. (It is curious to observe, in passing, that the German word *vetter*, meaning little father, was still employed by Luther in the sense of uncle.) A peculiar modification of polyandry is found among the Reddies of India, where the son is betrothed when a mere child, and the bride becomes provisionally the wife of her father-in-law until her real husband reaches the age of maturity. Now, in Ladak, Moocroft reports (see McLennan's "Primitive Marriage") that when the eldest of the brothers marries, he takes possession of the family estate. The junior brothers are then received into the

home as inferior husbands. On the death of the eldest brother, his property, authority, and *widow* devolve upon the next brother. The right of succession is here distinctly connected with the possession of the widow. Finally, we see this polyandrous custom in its decay in the laws of Manu, which prescribe the marriage of the widow only in such cases where the elder brother has died without leaving male issue.

To make the application of all this to the case before us, we remark, in the first place, that among Arabs, also, heirship and the espousal of the widow went hand in hand. Before the time of Mohammed, the heir married one of the wives of his deceased parent; and in Pococke's specimen it is said "they inherited the obligation of marriage as they received property through marriage." Among the Hebrews the relics of polyandry are unmistakable. The Book of Deuteronomy says that when brothers lived *together*, and one of them dies without male issue, it shall be the duty of her brother-in-law to take the widow to wife. That this obligation was originally founded on the right of the younger brother to succeed to the vacant estate is plainly indicated by the ceremony of the shoe, which was the symbol of proprietary rights; and, to obviate all doubts, a declaration of mutual inter-dependence of heredity and marriage is distinctly put down in the Book of Ruth. If we see the duty of the Levirate here confined to cases where male issue is wanting, this is an instance of exact correspondence with the law as embodied in the code of Manu. Another instance in point is the peculiar relationship subsisting between father's brother and nephew. In 1 Sam., x, the uncle of Saul completely takes the place of the father. The duty of the uncle to redeem the property when its preservation is endangered is based on the right of succession formerly vested in father's brother. As a rule, the cousin has the first claim to the hand of an heiress, and this rule was also observed among the Arabs. The fact that the cousin was *eo ipso* the accepted suitor, gave rise, as I conceive, to the triple signification of the word *dod* in Hebrew, being uncle and cousin (like the German *vetter*), and finally, lover in general. Again, the narrative related in Gen. xxxvii, xxxviii, recalls the custom noticed above by which the father-in-law takes possession of the bride during the minority of his son. Our interpretation is confirmed by the fact that not only is Tamar there justified for taking this means to secure progeny, but the offspring of her union with her father-in-law becomes in time the legitimate heir, the ancestor of the princes

of Judah, and thus of David himself. How the same word in Hebrew could describe the different relationships of bride and daughter-in-law is thus made clear. Conversely, the word *chom* for father-in-law means also brother-in-law in Arabic, thus showing the similar position which both held with respect to the bride.

Polyandry depends on scarcity of woman. That women were scarce among the southern tribes will not surprise us when we remember the incessant feuds in which they were imbroiled with their neighbors. Among the spoils of war women were always accounted the most desirable. It was also shown by the horrid tale told in Judges, xix. Polyandry existed among the Hebrews. In what way was it exchanged for monogamy? By war, by capture, say the authorities from whom we have quoted in the above account of primitive marriage. The younger brothers, occupying an inferior position in the common home, would naturally grasp at any means that seemed likely to secure them independence, Joining in the forays which were continually making into the surrounding territories, they would succeed, as their tribe grew strong, in bringing home booty, driving in cattle and conquering women, whom they might adopt as wives, and to whom none of the kinsmen could rightfully lay claim. Having now both the means and the opportunity, they would build separate houses and form individual families. To this every motive of interest and ambition impelled them, and of the purity of these their homes they would be jealous in proportion as they recognized in them at once the testimony and the safeguard of their independence. Instances of such capture among the Hebrews may be found in the foray on Jabesh Gilead and the forcible seizure of the maidens of Shiloh. Polygamy, indeed, did also occur. But there is good reason for believing it to have been an exceptional case, a luxury for princes and the wealthy. While it was practiced among the common people only then, when the hope of male issue had been baffled in the first instance.

It now remains to be seen whether we can discover in the geographical position of the tribe of Judah any element that conduced to elevate and refine the domestic institution whose foundation had thus been laid. Between the Judean mountains and the sea coast there is a fertile hilly tract of land which formed the disputed border-land of the southern kingdom. In theory, it is true, this region was assigned to the Hebrew tribe, but, in fact, it was never completely wrested from the grasp of the Philistine confederacy, and remained their

almost exclusive possession during the most momentous, the *formative*, epoch of Judean history. While the invaders of a country generally take possession of the level land and drive the aboriginal inhabitants into the mountains (I recall the familiar examples of Britain and Hindostan), we have here an unique instance of the very opposite taking place. The vigorous conquerors, destitute of chariots (the indispensable instruments for warfare in the plain), subdued the inhabitants of the mountains, and, having once chosen their seats upon the highlands, were unable to extend their boundaries into the valley below, being wedged in between the gorge of the Jordan on the east and the hostile lowlanders of Philistea on the west. The bearing of this circumstance on their history will be readily appreciated. They had brought with them from their previous nomadic condition a profound affection for their male offspring, and a chivalrous disposition toward the weak, which was displayed in the deference paid to at least a certain class of their women. They had gradually reared, as we have shown, at least the basis of the monogamic family; had gained private possessions, built private homes. To guard the integrity of these homes, to protect wife and children, now became their chief task, and in proportion as this task was difficult it increased their solitude and *matured their affections* for the objects of their care. And, indeed, it was difficult. "It is easier to raise a grove of olives in Galilee than to rear a single child in Judea," says the proverb, even in the time of the Talmud. The means of subsistence were often scarce, and the conditions of life at all times precarious among the rocks and precipices of Judea. More than all this, the incessant conflicts between the Judeans and the Philistine borderers which continued during so many long centuries, taught them to be ever on the alert, and compelled them frequently to lay down their lives in the defense of their hearth-fires. Common danger is everywhere a strong bond of union. The difficulty of obtaining or preserving an object lends a fictitious value even to what is in itself worthless. How greatly then must such considerations have tended to increase and deepen the domestic affections of an ardent and susceptible race which natural ties had already begun to awaken. Isolated, at war with the elements and with men, the Judeans drew closely together, and clung to each other for mutual aid and support. Here, then, as in Scotland and Switzerland, were developed the peculiar virtues that distinguish highland life — ten-

# INFLUENCE OF THE PHYS

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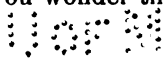




der devotion to each other among the nearest and dearest, and a firm bond of alliance between all the clansmen. The privacy of home gave rise to the sanctity of home, the firmer union of a single pair gave us the precious law of chastity, hardly known in a lower epoch. And thus among the heights of Judah the wife, the mother, for the first time in the annals of mankind, was exalted to her proper sphere. In the chronicles of the Judean kings alone (not in those of Israel), the mother's name is always added to that of the reigning monarch. She was called "the lady," and occupied a position at court only inferior to that of the sovereign himself. Athalia, a woman, reigned for six years in Judah. Here the words of *prophetesses* were listened to and obeyed. Here, later on, the idea could arise that a man "cleaves to his wife and they become as one flesh." And here that picture of the true housewife, which is unrolled to us in Proverbs, found its original: the picture of her who unites all womanly grace and gentleness, in whose environment reign health and comfort and beauty, "whose husband and sons rise up to praise her," who is the personification of all those dear, sweet influences which we gather into the one word — home. Among the solitary rocks of Judah, too, we behold the bloom of friendship flowering out in refreshing contrast to the general bareness and monotony of life. The covenant between Jonathan and David (which reminds us strongly of the institution of brotherhood between the "billies" in Scotland) was but the type of a larger practice. Indeed, all the members of the tribe were supposed to be united in a common bond of friendship. The Hebrews never employed such cold abstract terms as "one and another" to express the relations between human beings, but they said "a man and his brother," "a man and his friend." The remains of the former condition of their domestic life were now blended into harmony with the nobler ideal of the family which their highland life had developed. The younger brother was now no longer to wed the widow for the sake of enriching himself; but, frequently to the detriment of his own estate, he was asked to preserve the name and inheritance of his brother purely for love's sake. The same obligation rested, in certain cases, on the more distant kinsmen, and was based on the same unselfish motives. The rude forms of an all too intimate connection were thus adopted into the higher system, but so developed and modified as only to strengthen the singular and beautiful conception of solidarity of interests which now obtained in Judah.

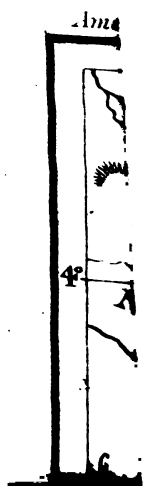
The influence of the domestic life of the Hebrews on their religion can only be briefly indicated here. It will best be understood if we remember that the religions of the Semitic peoples around them were founded on the double cult of pain and of pleasure. The one found its symbol in Baal-Moloch, the other in the Phœnician Venus. The worship of the one consisted in the immolation of children, that of the other in the practice of prostitution in the temples. Against both these forms of worship the heart of the Hebrew rebelled. How could he sacrifice his boy, the price of his love; how could he deliver his women to shame! Yet both these things were demanded of him, aye, demanded in the name of religion. Repelled on both sides, he was forced to take a new departure. It was, indeed, a revelation of Jehovah when Abraham drew back the knife from the immolation of his son. The fond affection of the Hebrew father and the cult of Baal-Moloch could not go together. The case of Michal shows us how the idea of chastity would put down the other form of Semitic worship. On an occasion of festive pomp, David performed one of those religious dances which appear to have been borrowed from the cult of pleasure. The wife expostulates with her husband and urges that it is shameful for him to expose himself before the hand-maidens. Yet, in so doing, she was opposing a recognized and wide-spread form of Semitic worship. The stronghold of the family and of monotheism was in Judea. Jehovah himself is represented by the prophets as the ideal Father, a Judge and Law-giver like the ancient patriarch. Israel is called his wife, the people are his children. Irreligion and unchastity are expressed in Hebrew by the same term. And the great name by which Jehovah is known is Holy God, which means pure God — God of purity!

The family, as a moral institution, is the creation of the Hebrew people. If this were their sole achievement for mankind, it were enough to ensure them the high position in its history which the general voice has accorded them. In the crucible of their early trials, that pure gold was refined from its dross, and was worn ever after, a priestly fillet, inscribed to All Holiness! When the Hebrews were forced to abandon the land of their fathers, they left it with character fully formed. Lonely as they had been, they continued this course through the ages, erect, self-poised, secluded from the intercourse of men. The love of the miraculous never quite died out in their midst. But, above all their faults, shines forth this one great virtue — the hallowed purity of their homes. Do you wonder that a people so



small and weak could resist the malice of its foes? Do you ask how it came about that they, without a common center of union, were not long since crushed out from the earth's surface? I answer that the *hearth* was the center of their union. There each atom gained consistency sufficient to withstand the pressure of the world. Thither they could come to recreate their torn and lacerated spirits. There was the well-spring of their power. By this they lived.

The task which I attempted this evening is a great one, and a faint outline of what might be achieved was all that I could give. The part which physical geography plays in aiding the developments of human thought, is, indeed, great. True, the powers and possibilities reside in the mind itself. But had not the opportunities of the external world called them forth, they would even now continue to lie dormant. This close connection between the material and the mental may startle us at first. But it will cease to give us pain if only we remember that each is but the fleeting phenomenon of a transcendent and ineffable source. Over the abyss of waters you see a mist hovering momentarily. Light-beams from a far off sun glance over it; are reflected there, fitfully, in *diverse hues*. So, like a mist of morning, the spirit of man broods over the unknown. And if the without and the within are diverse reflections, which he struggles in vain to unite in one white beam of certainty, let him find comfort in the presentiment of that greater Light beyond in which both are surely one unbroken.





# DR. ROHLFS' EXPLORATION OF THE LIBYAN DESERT.

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Synopsis of the Remarks of DR. GERHARD ROHLFS,  
Before the Society.

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When, in the winter of 1873, Dr. Rohlfs set out from Germany for the purpose of exploring the Libyan Desert, his principal object was to determine the question as to the correctness of the discovery made by him in 1869, of the depression which extends from the Great Syrte as far as Egypt, and also to determine whether the *Behar bela Nea* (river bed without water) has an actual existence, and if so, whether the Nile, in prehistoric times, could have pursued a westward course through it to the sea. In order to decide both these important questions, Rohlfs resolved to push forward from the Nile, strike through the Libyan Desert, and, if possible, to reach the oasis of Kufra.

The khedive of Egypt furnished the means for the expedition in the most generous manner, and his generosity deserves special commendation, the more so for the reason that the questions to be decided were purely scientific.

In order to make the expedition as useful as possible, Rohlfs determined to surround himself with specialists in the different branches of science, and he succeeded in a short time in securing the assistance of gentlemen known not only in Germany but in all Europe as scholars of the first rank in their particular professions. Professor Ascherson, of the University of Berlin, accompanied the expedition as botanist; Professor Littel, of the University of Munich, as geologist and paleontologist; Professor Jordan, of the Polytechnic Institute of Carlsruhe, as professor of geodesy and astronomy; and G. Remelé, of Rhenish, Prussia, as photographer.

The expedition set out from Cairo in December, 1873, furnished with a splendid equipment. To this there belonged, among other things, 500 iron water-chests, enameled inside, which enabled the expedition to take along 50,000 pounds of water at once. Previous to their departure the khedive received the members of the expedition. The Egyptian Institute, presided over by the learned Mariette Bey, also gave them a reception.

The expedition ascended the Nile as far as Siout in a steamer provided by the khedive. From this point Rohlfs and his companions, with 140 camels, set out, in a westwardly direction, into the unknown interior of the mysterious Libyan Desert. They marched eleven days over a plateau 400 meters in height, perfectly bare, and without a sign of life or vegetation. They found themselves, at the end of eleven days, on the edge of a declivity, at the foot of which, 150 meters below, lay the little oasis of Farafrah. You may readily imagine the astonishment and terror which struck the inhabitants of this oasis, only 200 in number, when they suddenly beheld so large a caravan moving upon their town. As this oasis afforded no resources to the expedition, they proceeded hence towards the south, and after a march of seven days they reached the oasis of Dachel, which contains 12,000 inhabitants, and is the most populous in the Libyan Desert. They stayed here a short time and then proceeded further towards the west. Sand hills, in parallel chains, 150 meters in height, and from 100 to 150 kilometers in length, with intervening spaces of from two to five kilometers, obstructed further progress towards the west. Accordingly, it was decided to take a north-north-west direction, with the hope of reaching the oasis of Jupiter Ammon. After a march, which is without precedent in the history of African exploration, with no guide but the compass, sextant and theodolite, finding no water during an interrupted period of fifteen days, they finally reached the celebrated oasis of Alexander the Great.

As another *Behar bela Nea*, marked upon the map, had here to be explored, Dr. Jordan left the expedition at this point and undertook this task. The expedition returned to Farafrah, unassisted by guides or by designated roads or paths, and was soon joined by Dr. Jordan, who in the meantime had visited the oasis of Beharigh. Thus the principal objects of the expedition were accomplished, and it returned by the way of Dachel and Chargeh to Esuch on the Nile, and thence down the river to Cairo.

The results of the expedition, as laid before the Egyptian Institute, which assembled to receive the report of the explorers, are substantially as follows:

1. A *Behar bela Nea*, as a continuous empty river bed, does not exist. Consequently the Nile, in pre-historic times, has occupied its old river bed.

2. The Libyan Desert does not participate in the depression which extends northward from it.



3. This depression is established as true by exact measurement; in other words, as a depression, on an average, twenty-five meters below the level of the Mediterranean Sea.

Furthermore, the Libyan Desert was exhaustively explored, botanically, geologically and paleontologically, and the collections made are so numerous that all the museums may be supplied. All the principal points of the Desert were astronomically determined, and more than a hundred measurements of elevations taken. The Egyptian temple in Dachel was excavated and photographed in detail. The interesting hieroglyphic writings and sculptures have been translated and are described by Professor Lepsius in the *Magazine for Egyptology*, published in Leipsic by Hinrichs.

Aside from numerous monographs contributed by the members of the expedition to various periodicals, a splendid album of photographs from the Libyan Desert has been issued at the expense of the khedive, a copy of which has been presented by Dr. Rohlfs to the American Geographical Society. The members of the expedition are engaged upon an elaborate work, which will be the product of their united labors. The first volume, with a description of the expedition by Dr. Rohlfs, and with contributions by Ascherson, Jordan and Littel, has already appeared. The succeeding volumes will be as follows: 2. Botany by Ascherson. 3. Geography and Ethnography by Rohlfs. 4. Geodesy and Astronomy by Jordan. 5. Geology and Paleontology by Littel. A copy of the entire work will be presented to the American Geographical Society.

# EXPLORATIONS IN CENTRAL AFRICA.

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MR. STANLEY'S FIRST LETTER.

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## EXPLORING THE RUFJI.

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[From the New York Herald of December 2, 1874.]

ZANZIBAR, EAST COAST OF AFRICA, *October 19, 1874.*

As I sit down to the table and take up the writing implements to record my experiences of the last few weeks, a wish darts to my mind, that the art of writing was never invented. It is true. Writing to me is such a labor at this moment. I have but the day before yesterday returned from the exploration of the Rufiji river and its delta; returned only in time to be compelled to write to you of what I have seen, because if I do not take advantage of the four days of grace given me by the stay of the mail steamer in port, you and your readers would have to wait another month before information could be received by you of the movements of your "Commissioner." Yet would I gladly avail myself of some excuse—a reasonable excuse—to postpone writing to you for various reasons. One main reason is, that it is exceedingly hot and the perspiration is unrestrainable, and a feeling of lassitude and *ennui* which has succeeded the return to Zanzibar from our exploration of the Rufiji is inimical to physical exertion or mental thought. Besides, every few moments I am troubled by the arrival of volunteers for the expedition into the interior, the rumor of its intended departure having stirred up an heroic desire in the minds of the able-bodied and poor people, residents of this town, to visit the distant regions of Africa, where the tribes are called Pagans; where elephants—and consequently ivory—are numerous; where there are vast extents of level country "covered" with game of all kinds. These volunteers come to make "shauri"—to hold a palaver or talk—to question me respecting the amount of pay I can afford to give them, the probable duration of the journey I propose to make, the countries I propose to visit, and other things of like nature. These volunteers are not to be despised; they are not

to be told to depart without words of a conciliatory and friendly kind, for out of this class the members of the expedition must be selected, without whom its objects could never be consummated. This palaver, therefore, requires time, tact and patience; and though I am inwardly fuming and storming at these several interruptions I endeavor to commend myself cheerfully to my fate, hoping that my apparent placable disposition will invite confidence on the part of the volunteers, and that my excuses, which I humbly tender, may conciliate the editors of the *Daily Telegraph* and the *New York Herald* for the brevity of this letter or the sterility of its information.

Ever since my march to Ujiji in search of Dr. Livingstone I have entertained a desire that I might be permitted to explore that most promising of all East African rivers—the Rufiji. Burton, my heroic predecessor in Africa, had, with his usual industry, collected much valuable information respecting this river; and when, subsequently, I heard from the natives that all the small streams to the south of that country were received by the Rwaha, or Rufiji—that the Kisigo, an important river in Urori, which is south of Ugogo, also emptied into the Rwaha—I mentally placed the Rufiji among the list of those rivers whose navigation benefits commerce and the world. I entertained the opinion that the Rufiji was a river worthy of exploration; that it was a river likely to benefit East and that portion of Central Africa contiguous to it; that by its means the Gospel might find readier and more feasible access into the interior than by any other route, not even including the Wami river, whose utmost limit of navigation I place at Mbumi-Usagara, at the foot of the Usagara mountains; that by means of this noble stream the white merchants of Europe and America might exchange their cottons and beads for the valuable products of the interior. I say this was my opinion, until I saw in some geographical publication two several accounts of explorations of the Rufiji. The first purported to be an account of an exploration made by Dr. John Kirk and Captain Wharton, of the surveying ship *Shearwater*, in a steam launch; the second was made by Captain Elton, first assistant to the political agent at Zanzibar, who proceeded inland from Sumanga, on the north side of the Kikunia mouth of the Rufiji.

Messrs. Kirk and Wharton proceeded as far as Fugulia, which I presume to be the same as that which the natives call Agunia, or near it. Captain Elton reached Mpenbeno, ten miles higher up the river. All these gentlemen expressed themselves emphatically against

the possibility of utilizing the Rufiji river. Of course, after such emphatic expressions of opinion, I dared not hope that I would return from the Rufiji with any better opinion of it. The following letter will show what my impressions of the navigable utility of the Rufiji are, with which I venture to say nine-tenths of American river steam-boat captains would at once agree if they were called upon to examine and report upon the river :

At 3.30 P. M., on the thirtieth of September, I sailed from Zanzibar in the Yarmouth yawl *Wave*, bound south. The yawl was purchased for the purpose of exploring the portion of East Africa which I considered to be of most interest to the philanthropic and commercial public of England and America. Through the courtesy and kindness of the gentlemen of the Peninsula and Oriental office, on Leadenhall street, and those of the British India Steam Navigation office — more especially Captain Bayley, of the former, and Messrs. Mackinnon and Dawes, of the latter — I was enabled to have her safely shipped and landed at Zanzibar without damage, though she was a large and heavy boat. Her dimensions were forty-one feet length and nine feet beam ; with her deep rudder shipped she drew five feet, which we afterward found to be a disadvantage. Had I been wiser, I should have ordered a second rudder, specially made for river navigation, to be exchanged on entering the river for the sea rudder.

The crew of the *Wave* mustered, beside myself, two efficient, industrious and willing young Englishmen, Francis and Edward Pocock, twenty-four Wangwana, or freemen of Zanzibar, armed with Snider rifles, two black cabin boys and a cabin passenger in the shape of a thoroughbred English bull-terrier, Jack, who, for his fare and passage, was to make himself useful at night while on the Rufiji to warn off midnight plunderers. If you add as stores two casks of water, a thousand pounds of rice and some cabin provisions for the whites, it will be seen that she was a boat of some capacity. Several officers of the cruising fleet at Zanzibar, who had seen her at anchor in port, had spoken highly of her, and some had said that she was just the kind of boat Her Majesty's cruisers on the East Coast of Africa ought to be supplied with for slave dhow catching in shallow waters. After a three weeks' trial of this kind of boat, I am inclined to the same opinion. With a moderate monsoon breeze, she travels faster than any steam launch that ever came to Zanzibar could. As an instance of her sailing qualities, it is worth mention that on a run

from Bagamoyo to Zanzibar, a distance of about twenty-five miles, the Wave beat a large dhow by two hours.

After rounding Shangani Point we were favored with a stiff breeze from the south-east, and steered for Mbwenni, on the mainland. The natives yelled their approbation of the speed at which the Wave dashed past the dhows bound for the coast of the mainland. Owing to the head wind we were compelled to pay close attention to our course and keep a good lookout to avoid the numerous reefs and sandpatches which make the navigation of the sea in the vicinity a difficult and perplexing task to a novice. No sooner had we passed by the pale green waters of the South Lackbrey bank than the Northern Harps indicated their presence by their gleaming tops of sand and a thousand short snow-crested waves, which tumbled tumultuously over their low sloping shores; while on our star-board side the Hamisa bank and its dangerous neighbors showed horrent enough by many an angry looking wave. A short half hour of swift sailing brought us in the neighborhood of the ugly dark coral reefs, strangely called the "Cow Reefs," which cover an area of about three square miles. The helm was pressed hard down, and the Wave was forced almost in the very teeth of the rising gale. Not until the last white crest over the reefs had disappeared from view, were we relieved from anxiety and able to share in the general enthusiasm of the crew at the perfect behavior of the tiny vessel.

Shortly after dark we anchored at a point a few miles north of Mbwenni and disposed ourselves to sleep as best we could, the surf sounding drearily monotonous in our ears, and a faint rumor of the noises of the night which are caused by the myriad insects of tropical Africa reaching us only during the pauses of the heavy surf-beats.

At dawn we were wakened, thoroughly damp and cold from the night dew, and one of the young Englishmen was soon obliged to lie down again from his first attack of fever. It struck me at this moment that we were engaged in rather a foolish trip if we intended to tramp into the interior, and that to brave the malaria of the Rufiji delta just as we ought to be sparing of the health and energy we brought from Europe was not a wise proceeding. This thought, however, was but the consequence of the misery in which we had passed the night and the damp cold we then experienced. It was soon stilled, however, by the genial warmth of the rising sun and by the bright green appearance of the palms and patches of forest which lined the shore.

With a favorable land breeze we sailed southward, clinging to the shore as closely as possible that we might lose nothing of the riant beauty of the varied and interesting bits of land scenery.

Some people may, perhaps, object to the term "interesting," applied to East African scenery; but I maintain that a cluster of palms, overtopping an humble little fishing village, with a background of dense jungle, swathed in deep dark green, and a foreground of a white, sandy beach, laved with ocean waves, deserve to be termed interesting. The palms and sea contribute that which makes the picture one of interest. Without the palms the background would become a mere jungle; without the sea before it the sandy beach would represent nothing but sterility.

Taken in this sense, then, in coasting southward numbers of such scenes are revealed, becoming only more interesting when a more important town comes to view, with numbers of square white houses, like so many white-painted blocks of wood under the ever-beautiful palm groves. Such a town is Mbwenni, near Cape Thomas.

From Mbwenni southward to Dar Salaam the coast retains the characteristics already spoken of. Small dark brown huts, clustered under the shade of a tree of ample foliage and enormous girth, are frequent, separated by jungle, through which a narrow footpath runs, serving as the commercial highway along the seaboard.

Soon after passing Konduchi, at a distance of forty-one miles south of Zanzibar, we come to Dar Salaam. This town possesses some interest as the creation of the late Seyyid Majid, Sultan of Zanzibar. As we round Condogo Point a group of islands make their appearance, consisting of Sinda and its neighboring islets, and westward of these a ridge of tall trees is seen. The tall trees are cocoa palms, and the presence of such a large plantation indicates in East Africa a town of some importance and magnitude. This is precisely what Dar Salaam was intended to be by Seyyid Majid. He found a fishing village of a few humble huts the possessor of an ample harbor where three times the number of his naval and mercantile fleet might lie at anchor, secure from the dangers of wind and a boisterous sea, and he at once conceived the project of making this fishing village a seaport and the depot for his Central African trade. He sent his laborers and slaves to clear the neighborhood of the jungle, which had voraciously swallowed up every portion of cultivable ground close to the water's edge. He then caused 200,000 cocoa palms to be planted, which in time, if carefully looked after and nourished, would bring

him in a revenue of from \$150,000 to \$200,000. A palace was built as a residence for him, and a fort or barracks for his officers and soldiers. Influential Arabs engaged in commerce were also invited to follow his example and take lots for building purposes. Several chose to do so, and about a dozen imposing edifices, compared to the former humble fishing huts, gleamed white and large in contrast to the green fronts of the palms. To those of sanguine disposition such a scene must have assured them that commercial progress was begun in earnest in East Africa, and that Seyyid Majid was a wise and energetic prince.

In reality, the Sultan of Zanzibar had inaugurated a work which all Europeans who look beyond home could heartily commend. The trade with Central Africa was being rapidly developed; large consignments of ivory from new regions were constantly arriving at Zanzibar. New copal diggings were discovered near Dar Salaam, and to the westward and southward. What the Sultan's dominions lacked was a proper port for trade, and in the harbor of Dar Salaam he had found deep water and roomy anchorage, easy of access from Zanzibar and centrally located for the southern and northern towns. The sea-coast towns whence the caravans departed for the interior in search of ivory labored under various disadvantages. Mombasa, to the north, though possessing a moderately good harbor, was limited to the west by the vast hunting and marauding grounds of the Masai; to the north by the intractable Gallas; while to the south other towns claimed to be as good starting-points for Africa as Mombasa. Saadani, Whindi and Bagamoyo were dangerous ports for vessels, the approaches to each infested with reefs and sand banks. Mboamaji, to the south of Dar Salaam, had a similar disadvantage, while Kilwa was too far removed from Zanzibar.

Everything promised fairly well for the success of Dar Salaam as a future rival to Zanzibar until Seyyid Majid died. Then all the fine schemes relating to its prosperity perished as it became known that Seyyid Burghash, his successor, did not share in the views of his predecessor. The palace, the barracks, the houses, the palm grove, the fine harbor, with its deep, still, green water, are here to this day as Seyyid Majid's last effort left them, silent and comparatively deserted. Not one house has been built here since his death. The Arabs who did build houses preferred to remain in Zanzibar.

A few months ago the question was agitated in England as to what could be done with the freed slaves, and I remember that some sug-

gested Dar Salaam as the most eligible place where they might be settled and instructed in useful arts of industry, with which, after a visit to the port, I agree. Here are good, roomy houses already built, but uninhabited. A large area of ground already cleared of jungle, but comparatively uncultivated, a capacious and deep harbor, likely to suffice for the harboring of all vessels which may engage in East African commerce for the next hundred years, above which at present not a single flag waves.

I am informed that about 600 slaves have been captured within the last six months in the Mozambique channel by British cruisers. Now the question may be asked, what has been done with those slaves? Have they been, as usual, leased out to Mauritian sugar planters at so many dollars a head to remunerate the government for the expense it undertook to fit their men-of-war for these slave-hunting expeditions? Let us hope not, but we may as well be told what becomes of the freed slaves.

From the silent harbor of Dar Salaam we sailed next day, with the same stubborn headwind against us. We tacked and retacked for twelve mortal hours, sometimes dashing the spray over our bows with long lines of reefs close to our lee, and sometimes plunging in the deep blue of the ocean; and at night we anchored under the shadows which the palms of Kimbigi Head threw across the sea.

HENRY M. STANLEY.

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#### MR. STANLEY'S SECOND LETTER.

### EXPLORATION OF THE RUFIJI.

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[From the New York Herald of December 8, 1874.]

ZANZIBAR, COAST OF AFRICA, *October 21, 1874.*

The next day, delayed by calms and head wind, we cast anchor in the harbor of Kwale Island. The people are Wangwana, subjects of the Zanzibar Sultan, and may possibly number 300 souls, all told. The one village which it boasts is on the western side, close to the port. The island is situated in latitude  $7^{\circ} 25'$  south. The mouth of the Dendeni river, on the mainland, is to be seen nearly north-west of Kwale.



The first thing that struck me as remarkable on this island was the large number of gigantic boabab trees. It seemed to me, when well screened from view of the sea by foliage, that I had suddenly stepped into a portion of Ugogo. The next things that caused me surprise were the very large and very small hens' eggs that were proffered to me for sale. The large eggs were of the size of geese's eggs, while the small eggs did not much exceed in size pheasant's eggs. Goats were numerous and cheap; two were purchased by us at a dollar each. The people seemed not to have much occupation. Those who owned land possess domestic slaves to cultivate it, while they themselves chat and sleep, sleep and chat from morning until night, and through the night till morning.

From Kwale we sailed, after a night's anchorage in the port, past the islands of Pembagu and Koma, the latter of which is inhabited by a few people who obtain a precarious living by planting millet and holcus and by fishing, and steered straight south for a broad opening in the dense foliage which lined the mainland. Arriving before this opening, which we took to be one of the mouths of the Rufiji river, we were favored with a stiff nine-knot breeze from the south-east, and as the water appeared dark green, indicating considerable depth, we sailed boldly in with all sail set. When quite within this mouth we observed one broad avenue of water, leading south-south-west, and another south-south-east, equally wide, but, being ignorant of the exact course of the true river, we anchored at the distance of a mile and a-half from the sea, close to that part of the land near which the two branches conflowed. When we had communicated with this shore, which we ascertained to be the Island of Saninga, we learned that, led by accident, we had halted but a few yards from the spot where the steam launch of the Shearwater had anchored prior to her departure up stream in 1873.

We had not been at our anchorage ten minutes before a colored gentleman of stoutish build and cleanly, good natured face was seen paddling alongside our vessel, who introduced himself as Moeni Bana-Kombo ben Ahad, which, rendered into English, means Lord and Master Kombo, the son of Ahad, chief of Saninga Island. Probably, according to a previous generous act, he had brought with him a weighty chicken and three fresh eggs, which we reciprocated with a gift of royal Dabwani cloth.

Kombo, the son of Ahad, chief of Saninga Island — who, though the Wangwana of his village styled him "Jimrie," I prefer shall

remain as he designated himself — was wise and learned respecting the geography of the Rufiji river, and volunteered, for the information of the curious white people of the white people's country, "Ulyah," several interesting facts. The two white men of the "smoke boat," Dr. Kirk and Captain Wharton, he remembered perfectly. They asked him endless questions, until he was quite tired — "choka sana" — and put down ever so many things in a little book that he, Kombo, the son of Ahad, had told them.

"Very good. Is there much water in the Rufiji river?"

"Plenty," answered Kombo, confidently.

"What do you call plenty?"

"Deep water — very deep."

"Good! How many pima" ? (fathoms).

"Sometimes five pima, sometimes four, sometimes three; but always plenty."

"Do you know this river from what you yourself have seen?"

"No; I have never been up."

"Ah! then how do you know there is plenty of water in the river?"

"Huh! have I not my people who go up and come down?"

"Why do your people go up and come down?"

"To trade, of course."

"What do they trade?"

"They take up salt and cloth and bring me msan-durusi (gum-copal), which I send to Zanzibar to sell."

"Very good. Perhaps you can lend me one of your men who knows this river to show me the way and to talk for me to the people in the interior?"

"Yes; I can let you have two, one of whom showed the way to the white men of the 'smoke-boat.'"

We had entered the Simbooranga mouth of the Rufiji river, and we were told this was not the largest debouchure of the river. Its noble breadth of surface, its depth of clear green water promised well to us. In the center of the stream an ocean steamer might float in perfect security, though there is a fall of ten feet at lowest ebb in the water.

Saninga island possesses one village, and its position before the mouth of the river is indicated by the presence of a few tall palm trees, which rear their graceful leafage above the surrounding vegetation. Looking westward, southward and northward, we note that

the two branches of the broad stream which conflow near the Simbooranga mouth are bounded by "league beyond league of gigantic foliage, by lofty summits of resounding mangrove woods, which grasp the depths and grapple with the floods."

Dingoti island forms the southern boundary, and Simbooranga island the northern boundary, of this noble entrance to the Rufiji delta. Near the shore of Saninga there were two small dhows, which were employed in conveying wood, for building purposes, to Zanzibar. Sometimes they also conveyed rice and gum-copal to that Arabian port.

A few Banians live on Dingoti island, who keep cows and cultivate the ground, and sometimes trade with the villages up the Rufiji for rice, which is of a most superior quality.

Early next morning after our arrival in the Simbooranga, we sailed up the right branch, which came from the south-west. Our two promised guides accompanied us. That the reader may understand our experience of the navigable utility of the stream we were about to ascend, to save needless repetition, it must be borne in mind that our deep rudder, common to Yarmouth yawls, caused our vessel to draw five feet of water. It being the south-east monsoon, we were fortunately favored with a strong breeze from that direction. The Wave fairly flew against the ebb up stream. Contrary to what we had anticipated, the scenes which each bend and curve of the river disclosed, as we ascended, were of exceeding beauty. Both banks of the river were clothed with dense varied green foliage of a uniform height, which gave it an appearance of a broad canal, with a tall green hedge on each side. We had ascended some five or six miles before the water, despite the ebb tide, began to be discolored. Then it gradually changed from its clear, pale green to a muddy gray, and became rather sweet to the taste.

A large number of creeks were seen on each side of the river. Some of considerable size on the right side, we were informed, connected the Simbooranga with the Kikunia mouth of the Rufiji. Others on the left side joined the Simbooranga with the more southern and larger mouth of the Rufiji, the Magambu, each of which I promised myself I should explore. As I noted these internal channels of this great maritime delta, I became more and more interested, as its exploration promised to disclose something different from the reports sent to England by my predecessors. Every few moments, when doubtful of the depth of the river, I caused one of the young

Englishmen to sound with a long boathook, over nine feet in length, and eight times out of ten I heard the cheery cry of "No bottom." Sometimes I felt anxiety, going at the rate we did up an unknown river, when the cry was "Just touched, sir," or "Getting shoaler;" but a movement of the tiller, after consultation with the guide, was almost invariably followed by the cry of "No bottom" again.

In this manner we proceeded for two hours, until we came abreast of a large creek which separates Salati island from Surveni island, when, through inattention and a feeling of over-security, we missed the channel and in a short time were aground, which sprung the iron pintles. The halliards were let fall, the rudder unshipped, and we proceeded to straighten matters by straightening the pintles and cutting out a portion of the rudder. A few moments later the damage was repaired, sail was hoisted again, and the center of the stream was tried, only, however, to run aground again. We labored with sail and oars to find a feasible channel for some time, but failed, and I began to think that my predecessors must be correct in their estimate of the commercial utility of the Rufiji, until, hugging closely the northern bank, we heard the cry of "no bottom," and proceeded on our way as smoothly as though the Rufiji river was many fathoms deep.

Five miles from this place we came to where the Kikunia mouth of the Rufiji branched from the Simbooranga in a north-easterly direction, apparently a much more insignificant stream than the latter; but the guide said that, though the Kikunia was narrow, it was deep.

Two miles higher up we arrived at a broad lake-like expanse of water, out of which branched to the south-east a much mightier stream than the Simbooranga. This was the Magambu, the principal mouth of the Rufiji river. It was studded with beautiful islands. Its lengthy, straight, broad reaches of water were banked by enormous and lofty globes of foliage; its islands and banks were the homes of vast numbers of aquatic birds; hippopotami sported in its depths; and on the gray spits of sand numbers of crocodiles basked in the hot glowing sunshine. Altogether it was a grand picture, and most alluring to the explorer. Over the mighty expanse of water blew the freshening breeze of the monsoon, urging our good little vessel at a quickened speed, and waving the topmost boughs of the forest, exposing the sheen and glister of their leaves, besides cooling our bodies and renewing vigor within us, until we laughed in mockery of the malaria of the extensive delta, and our healthy appetite began to rage for food.

An hour later, the thick, tall forest, which had hitherto covered every space save that occupied by the watery channels of the delta, began to thin sensibly, and vestiges of former cultivation appeared. Now and then a tall dark cluster of trees, overgrown with convolvuli, was seen, at the dark shadow and gloom of which one or two of my men, new to such tropical density of vegetation, shuddered.

By noon we had passed the most easterly feeder of the Rufiji — the Mbumi river — and were opposite Miehweh. The Mbumi issues from the north-west, and is about sixty yards wide at its mouth. Canoes ascend even this tributary a considerable distance.

Miehweh is the name of a small colony of villages, and a district which may extend about four miles along the northern bank of the Rufiji. The inhabitants cultivate rice fields, the products of which they exchange with the Banians of Kikunia and Pemba Bagamoyo, etc., for cotton, cloth and pice.

In order to illustrate the disposition of the natives, I will describe an incident which occurred near an island called Surveni, opposite Miehweh. A large flock of birds, kingfishers and whydahs, were shot at with a rifle ball, which, piercing the flock, was seen to ricochet a considerable distance beyond along the surface of the river. After we had proceeded a mile, we detected several canoes close to the Miehweh bank, trying to outstrip us. Four continued their way, while one canoe separated from the other, which, taking advantage of the dead water along the lee of some islets, was soon able to overtake us.

One of our guides hailed the solitary canoeman and asked him what he wanted. He answered that he had come to inquire who we were, and for what purpose we had come to the Rufiji, and why we fired bullets, to the imminent risk of people fishing in the river. His reply and questions were given with that force, volubility and rasping harshness I remembered so well were the characteristics of the voices of the Wagogo when angered.

The guide replied mildly that we had "come to see, that's all" — *Tembea tou.*

"To see; see what?"

"To see the river."

"What for?"

"To see. Why? God knows! The white men do such strange things. They put it down in a book, and that is all I know that ever comes of it."

"Huh! How far do they intend to go?"

"As far as there is plenty of water for the boat in the Rufiji."

"Inside?"

"Yes, inside."

"Huh! The Rufiji extends far — many days' journey— and there is always water in the Rufiji."

"The white men intend to go and see for themselves how far there is plenty of water."

"How much do they intend to give me for shooting on the river?"

"Nothing."

The breeze came down over the tops of the trees, bellied the sails out full and large, and the Wave passed by the prurient native irresistibly.

Half an hour later the Pamfouneh district west of Miehweh was reached, with the tide and wind now strong in our favor, and soon after we came to Bumba, the remaining mouth of the Rufiji, which relieves the channel of the river proper of its volume of water. Bumba, accordingly, is also an insignificant stream compared to either the Magambu, Simbooranga, or the Kikunia. Its appearance and breadth corroborated the guides' report. Lower down the Bumba divides its waters among the Nguruweh, Otikiti, Simaya Mtote, Njemjia and Mdwana mouths.

At Kisembea, situated at the head of a long reach of the Rufiji, whose course here came from the south-east, large numbers of people flocked to the banks of the river to observe the strange phenomenon of a large boat towing another one and going fast up stream by means of sails. They had heard of a "smoke boat" having ascended as far as Agunia, lower down, but they had not seen it, though they marvelled much that such things should be. They were exceedingly inquisitive, and wondered that white men should come so far to "see" only water. Long after we had passed them we noted that the strange incident was being discussed by the interested groups, who had greedily fastened their eyes upon the boats and their belongings as they glided by them.

Beyond Kisembea, the Rufiji's course has a straight three-mile reach from the south-south-west. It has a breadth varying from 400 to 250 yards, and the channel is deep and easily found by observing the banks of the river. At no place could we find soundings with the boat-hook. Any river-steamboat man in America could, so far, have found no fault with the stream. It was marked by every characteristic of a navigable river. From the sea up to Kisembea, a distance

of twenty-two miles as I made it, the largest steamer that floats on the Mississippi river — which I believe has a tonnage of over 5,000 — might ascend and descend without any impediment. The Wave ran aground twice in that distance, but it was our own fault — we had missed the proper channel. When we had ascertained it we found plenty of water and no difficulty.

Marenda district, which succeeds Kisembea as we ascend, is very populous, and small villages are found in clusters. The plain is exceedingly fertile, and produces rice, holcus, sorghum, Indian corn sweet potatoes, vegetables in abundance; cocoanut trees are frequently seen, while the plantain is most prolific.

At sunset we anchored in midstream opposite Jumbe, at a distance of forty miles by river from Saninga island, congratulating ourselves that we had done a good day's work, having then ascended at least twenty miles higher up the Rufiji than any other white man, and with a conviction strong in our minds that our predecessors had libeled the noble river without sufficient cause.

I despatched men on shore as soon as we anchored to convey my most respectful salaams to the chief Jumbe, and to inform him that I should be delighted to make friends with him, which message was cordially received by him, at the same time that he took occasion to send me tokens of his regard in the shape of five cocoanuts and one chicken.

Had I not done the diplomatic thing, our guides informed us that we would very likely have been visited by "river thieves" during the night.

Next morning Jumbe came, bringing with him more substantial tokens of friendship, and quite a retinue of chiefs, until our boat, already well loaded, had her gunwales but a foot above water.

After reciprocating Jumbe's acts of friendship, the first questions I naturally asked were relative to the length, breadth and depth of the Rufiji river; the countries round about him and the slave trade; its land route, and what the prospects of opening legitimate commerce between him, his people and neighbors, with white people. What information may be embodied in the following remarks, has been gleaned from him, the chief of Saninga, the guides, and Hasson bin Salim el Shaksi whom I met next day.

First as regards the Rufiji river, its length and value to European merchants.

All parties united in informing us that the Rufiji river rises in

Gangeh — Ugangeh, according to Arabic and Swahili traders, which, as near as I can make out, with a desire to be as accurate as possible, is south by west of Unyamyeinbe. The main branch, known in the far interior as the Rwaha, comes from south of west from Jumbe; the lesser branch, but an important one, is called Kienga, and comes from the south-west, from possibly the same range of mountains as the north-western branch of the Rovuma takes its rise. On traversing Ugangeh, the Rufiji, as yet an insignificant stream, flows eastward through Northern Unena, then the country of Sango or Usango, when, arriving in Urori, it gains power and volume by an accession of many small streams which drain the pastoral land of Urori.

The Warori, or people of Urori, use this stream greatly. They fish in its waters, they hunt hippopotami for the sake of its teeth, and for hides to make their shields; they convey butter and fat long distances up and down in canoes to trade for salt; they voyage on it for important hunting excursions; from all of which I gather that at a distance of 240 geographical miles from the sea, the Rufiji is of magnitude sufficient to be utilized by the natives; and from Hassou bin Salim el Shaksi, who has crossed it several times in Urori, I believe that it is about forty or fifty yards wide, with numerous fords in it, where the water only comes up to the hips — say about three feet deep.

HENRY M. STANLEY.

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### MR. STANLEY'S THIRD LETTER.

## UNDEVELOPED COMMERCE OF THE RUFIFI.

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[From the New York Herald of December 4, 1874.]

ZANZIBAR, COAST OF AFRICA, *October 23, 1874.*

It is well known to travelers who have been in Central Africa that Urori is a large country situate south of Ugogo. Along the southerly frontier of Ugogo rise several streams, the principal of which is the Kisigo, abounding with hippopotami and crocodiles. East of Urori commences Kasungu, through which the Kisigo and its sister streams flow into the Rwaha, which soon becomes known as the Rufiji.

After traversing Kasungu, along a distance which the Arabs desig-



nate an eight days' journey, the Rufiji enters Katanga from the south-west, from which may be deducted the inference that the river makes a deep bend before reaching Katanga. From Katanga to Matumbi is ten days' journey. From Jumbe to the Matumbi mountains is a distance of thirty miles. On the other side of the Matumbi mountains the Rufiji is joined by the Kienga river, which, as I said before, comes from the south-west.

According to Jumbe and two of his chiefs, who had ascended the Rufiji as far as Matumbi, the river is deep enough for a boat the size of the Wave (they were not aware that she drew five feet), but there are several bars during low ebb which impede navigation, so that, though we might ascend far, we should find plenty of trouble and hard work. Our gig, they said, might easily ascend as far as Urori if the natives permitted us, but it would require talk and bongo cloth.

The resources of the country around us, of Jumbe and the neighboring tribes, were manifold, according to native report. Jumbe himself could sell me, if I required it, three times as much rice as would fill the Wave. The people round about possessed abundance of this grain. On the entire Rufiji plain, between Matumbi and the sea, I might collect as much rice, Indian corn, chickens and eggs as I needed or could take away cheap. Jumbe would sell me fifteen measures of rice for cloth worth one dollar at Zanzibar. Only six measures of rice sell for one dollar at Zanzibar. In exchange for their products they were willing to receive silver money, dollars and rupees, umpice, crockery, glassware and cotton cloth, Merikani and Kaniki.

At the base of the mountains of Matumbi is to be found an abundance of gum-copal, the fossil gum known here as msan-durusi, from which carriage varnish is made. It is sold by the frasilah, a weight of thirty-five pounds. At the base of the mountains, where there is an inexhaustible supply of it, it can be purchased at from one dollar to three dollars per frasilah, according to the talents and eloquence of the purchaser. At Zanzibar it ranges in price from seven dollars to nine dollars per weight of thirty-five pounds. This means, supposing a steam vessel drawing but thirty inches of water, especially constructed for river navigation, with a capacity of thirty tons, were to proceed up the Rufiji to the copal diggings, and purchase thirty tons of this gum at three dollars per weight of thirty-five pounds, that at Zanzibar the enterprising merchant could sell his cargo to the first European or American merchant for eight dollars

the frasilah at this very moment; in other words, obtain the handsome sum of \$12,500 for an outlay during a few days or weeks of \$5,700.

Beyond Matumbi all the countries north, south and west contain ivory in greater or lesser quantities. Urori is rich in this precious article of trade. The same enterprising merchant, having employed the late dry season in the collection of his gum-copal cargo, could proceed safely any distance up the Rufiji as far as Urori, where he could have, of course, an agent in advance of him, and collect easily a cargo of thirty tons of ivory. This article is worth in Unyanyembe one dollar per pound; in Urori it may be purchased at from sixty cents to ninety cents per pound.

If we make a tabular estimate of the cost and profit to be obtained in this trade your readers will perceive for themselves of what value painstaking geographical research is to the merchant:

To cost at Zanzibar of thirty tons ivory, at \$65 the frasilah	
free of all duty .....	\$124,800
To cost in Urori of thirty tons of ivory, at \$31.50 the	
frasilah .....	60,430
Clear profit, £11,016 9s. 6d., or.....	<u>\$64,320</u>

Ugangeh is richer in ivory than Urori, according to the Arabs; but until my exploration of the Rufiji I admit that I never heard of this country before; but there is such a vast extent of country west of the Rufiji delta so little known that long years must elapse before the geography of eastern Central Africa can become known. Ugogo at the present time contributes occasionally large supplies of ivory to the coast; but the labor to obtain it by land, the tribute to which the merchant is subjected, the annoyances of which he is the object, are so great and many that, once the river traffic was opened, the proud Wagogo would be compelled to carry their own ivory to the Rufiji for sale.

Katanga and Kasungu are both new countries, now made known for the first time; so, also, are Korongo, Koni, Toleya, which lie on the north side of the Rufiji, between Kazungu and Matumbi. Descending the river from the Matumbi Mountains, the great plain which lies between them and its maritime delta extends before the eye, bounded to the north-east by the purple lines of the distant hills and ridges of Keecki and Wande; eastward, by the dark, gloomy

forests of the delta; southward, by the countries of Muhoro and Kilonga, which, from a distance, present an appearance of unbroken forest.

This great plain of the Rufiji is the creation of the river. The rich deposit it has left during ages is fathoms deep. On its surface, enriched every rainy season by the dark mould left by the inundations, lies inexhaustible wealth. Sugar, rice, grain of various kinds, thrive wonderfully on the fat soil. It is the most populous district I have seen during four journeys to Africa, and I should estimate that at least 50,000 people inhabit this great plain. The villages stand in knots and clusters along the banks of the river, and from the time we passed Kisimbia until we anchored opposite Jumbe each bank presented troops of curious sight-seers, who stood in full view of us without the least fear or distrust, from which one may be pardoned if he concludes that they gained such courage from the knowledge of their numbers. Between Fugalleh and Nyambwa, I must certainly have seen some thousands of natives, who, though they chafed us considerably, showed the very best disposition—such a disposition as may be always looked for in a people with trading instincts.

Almost always the second question propounded to a native by me on this river was, "Do the slaves pass by this way?" They all answered me promptly, "No," following it with the required information. The answer each time was the same, except at Jumbe, where I discovered that I was almost opposite the exact spot where the Arab slave traders sometimes crossed. The route now mainly adopted by the slave traders—commencing from Kilwa Kivinja—crosses the Mgenga river, the Mto-Piani and, arriving at Perereh, passes through Sumanga, Ngumbu, Mainboro, Muhoro to Mirongegi, which lies close to Jumbe, and, crossing the river at Kisu, sometimes follows the northern bank of the Rufiji to Kikunia, a three days' journey to the slave driver. From Kikunia the main road is that which leads through Kisimeteh, Ngimpia, Sindaji, Kivinja, Kiviniga, Kisigu, and arrives at Mbuamaji, on the sea; or the slave caravan pushes on to Dar Salaan.

The route adopted by the slave traders mainly in crossing the Rufiji, is that which skirts the Matumbi mountains via Ruhingo, on the river. All the eastern villages along the line of travel through the Rufiji plain are interested in the slave trade. They keep the slave traders informed of every item of news concerning the approach of any foe, particularly the white men, and I discovered that long

before we had arrived at Jumbe the natives knew of our coming. Messengers had been despatched from Miehweh by river and by land to herald our advent in the river, and I noted, also, that as soon as our boat hove in sight of any village of a principal district a couple of canoes well manned with paddlers left to inform those above that the dreaded Wasungu had at last invaded the river with two boats. On the morrow I was informed by a servant of Jumbe I should experience different treatment if I persisted in my intention of ascending the river.

In the morning we prepared to extend our discoveries up stream. The dew had fallen heavily during the night. The tall reeds which fringed the river banks dripped huge rain drops, which the morning sun transformed into the appearance of diamonds. Large crowds of natives speedily made their appearance and were witnesses of the preliminary work of getting under way, but they made no demonstration of hostility.

Soon after starting, our gig put to shore to convey a man aboard who expressed a wish to trade with the white men. As the gig rowed hard after us with him, this native took fright at the sound of our bugle, which was blown to hasten the movements of the rowers, and took a somerset into the water, to the intense merriment of all on board and the sight-seers on shore. We at once dropped anchor to encourage him and to explain to him that it was a most foolish thing to be afraid of white men, who would never come up the Rufiji except as friends to the natives. We had the gratification to see him come on board again and depart with a profound respect for white people.

Continuing our journey, a few snags made their appearance in the river for the first time, but they presented no obstacles; the river was broad and deep enough on either side. Shortly after rounding a sharp bend of the river, the Matumbi mountains came clear and distinct into view, from which I surmise that we were not twenty miles from them. While admiring the scene so suddenly presented to our view we were approaching the northern bank of the river, on which a large settlement was visible. The district was called Kisu, and the people are strong upholders of the slave trade and hostile to white men, whom they have been taught to regard as enemies by the slave traders.

We were compelled by the channel to approach within a few feet of the bank, and had they been able to decide rapidly upon hostilities we all should have been exposed to great danger. The friendly breeze,

however, came on strong and fresh at this moment and we swept by them in an instant. But we had no sooner passed this than another large cluster of villages came in view, and a body of about 200 natives were seen at the landing place. As we drew near, the chief stepped out and hailed us, demanding to know what business we had on the Rufiji. He was answered by one of our armed escort, a tall, robust, young fellow, black as ink in features, but with an eye like a hawk and shoulders that in breadth would not have disgraced the best man in her Majesty's Life Guards.

"We are white men. What do you want?"

"I want you to stop for a talk."

"We don't want to talk just yet. We have not gone far enough."

"I want you to stop first before you go up further."

"Cannot do it, master," answered he boldly, and making a certain sign, which all understand who know East Africans, indicating that he was wearied.

"I tell you to stop."

"We are sick of stopping, master; cannot do it, master."

"Why have you come up the river?"

"To see."

"To see what?"

"The river."

"What about the river?"

"To know how far it goes and how deep the water is."

"How far do you intend going?"

"As far as we can."

"There are bars (jungo) on the river. You cannot cross those in that big boat."

"We will try to."

"Well, now, take my advice; stop here, or it will be worse for you."

"Impossible, master."

"I'll make you stop."

"Do so, then, and farewell to you, master."

The chief of Kisu was left fuming on the landing place, and men were seen running hither and thither in alarm, and the groups were seen to become small knots of men, violently gesticulating and stamping their feet, but all this time the Wave was plunging up river before a spanking breeze.

We were sailing gloriously along, and the Kisu chief and his vio-

lent people were left far behind. Bend after bend had been safely rounded, the mountains were seen more distinctly, when we suddenly stopped and half keeled over. Our deep helm was furrowing the sand at the stern, and the bow, though drawing but two feet, was fast. Extricating her from her position, we sought another spot, and after great difficulty managed to cross the bar. The sun was fearfully hot, and seemed to burn into our brains. The wind died away, and came only in cats'-paws. The current was not very rapid, as the river was broad at this place; but it was such laborious work with the oars that we had simply become subjects of derision to the jeering and hostile natives. However, we persevered, and, with one sail hoisted, we managed to creep along and make progress, though slow.

Soon we were requested to halt a second time by the shore people, but we paid no heed to them except to answer an occasional question. The excitement was evidently growing along the shore, and our continued progress despite all threats and commands seemed to have plunged them into a stupor of rage. At one village, a few miles above the larger settlements of Kisu, a friendly voice shouted out, "You cannot go further with that big boat; there is no water ahead;" to which we answered cheerily that was precisely what we came to know, and we would try, and if not able to go ahead we would return.

About a mile above the village the river widened to about 300 yards. The low shores seemed to be but dried sandbanks, and right across from side to side the water rippled uneasily, with every indication of a stubborn bar. The guides, as they looked at it, said at once that we had come as far as we could go in the large boat. We pushed on, however, and went aground. We unshipped the rudder, hauled down the sail, manned fourteen oars, and, with a vociferous chorus to the exhilarating boat song, we plunged forward, one of the young Englishmen sounding ahead. Again and again we tried it, but of no avail; over and over again we ploughed the sands, and stuck fast. Above this sand bar, which is about 200 yards in breadth, the river resumes its usual depth, but the navigation is impeded by sand bars.

After deliberating as to what had best be done, I concluded to return and explore the two other principal exits from the delta, the Magambu and the Kikunia, and then visit Matli island, opposite the Rufiji delta, after which I should have expended all the time I could spare before commencing my march into the interior.

On descending the river the natives shouted out to us, "We know

why the Wasunga have come to the Rufiji. You came here to find out about the slave trade—to catch the slave traders. Return and tell the other white people that we will not have the slave traders troubled nor their road crossed.

One chief was so furious that he followed us for half a mile with his men, cursing us and using the most violent language and gesture, but, fortunately for him, he confined himself to this verbal demonstration of hostility.

On the second day we entered the magnificent Magambu, and eight hours after commencing the descent arrived at the sea. Then, after setting sail, we sailed north again, and two hours later we entered the noble estuary of the Kikunia branch of the delta, and, before a vigorous breeze and an incoming tide, sailed up the river once more, and at night anchored at the mouth of Pemba creek. At noon the next day we had entered the Simbooranga, and descended that stream to Sanninga, where we were greeted with kindness by the people of that island.

Mana island we ascertained to be a most fertile island abounding in palm groves and shambas, or gardens. It is the third island in size within the sultan's dominions. Situated opposite the delta of the Rufiji, it seems as if placed by nature at this position as the *entrepôt* of the mainland, which is but ten miles distant. Ships of large tonnage could ride securely at anchor within 500 yards of Kismia Mana, a place which the Admiralty charts absurdly call Kissomang Point. Were not my letter already of such great length, I could easily point out the advantages of securing a portion of Mana—say the district in the neighborhood of Kismia Mafia—as a place to plant a colony of freed slaves, from which locality, after instructions and preparation, they might emerge as enterprising traders into the interior, via the Rufiji river. But I must leave these remarks for some future letter, for I must now hasten to give an unprejudiced opinion upon the value of our exploration of the Rufiji.

Readers interested in African exploration in new commercial avenues may see for themselves what the Rufiji is after reading this letter. It has lost but little in my estimation because I failed to ascend higher than Kisu in a boat built for ocean sailing. Had I possessed the Lady Alice, which Mr. Messenger, of Teddington, was building for me—and which has only arrived by this mail—I could have ascended, I believe, a couple of hundred miles, if not more, with my entire escort of armed men. For exploration, prudence

requires that we shall be prepared for all contingencies; that there shall be sufficient men accompanying the explorer to enable him with a few men to make a proper defense if attacked. Our gig would have conveyed eight men and a week's provisions, but she would not have made us independent of the land, nor strong enough to resist attack, which would have endangered the success of our great journey. As I look at the *Lady Alice*, I find her a boat of sufficient capacity to convey up any river a force of twenty-five men, with a month's provisions, yet she draws but twelve inches loaded. She is forty feet in length, six feet beam, built of Spanish cedar, in watertight compartments. A duplicate of this boat would enable any traveler to proceed up the Rufiji as far as any native canoe, after which the report of such man, on his return, of the navigability of the Rufiji would settle the question forever.

In the meantime, so far as we ascended, the Rufiji must be classed as a navigable river. Such a steamer as *Sir John Glover* possessed on the Volta, or one built after the model of an American river steamer, may proceed up the Rufiji with ease, whenever any merchant shall be found bold enough to enter on a promising African venture.

Our work of exploration also clears up the difficulties of annihilating the overland route of the slave trader. Steam launches, properly built for river navigation, commanded by officers familiar with river navigation, assisted by guides procured at Samuga island, may proceed either up the Magambu or Simbooranga mouth of the Rufiji, and, towing up with them a few light flatboats loaded with coal, could anchor them at Jumbe; and proceeding lightly loaded, could capture a few slave caravans and bring down their proprietors to be punished at Zanzibar. Any naval officer, acting discreetly and energetically, could strike within four days a most effective and deadly blow at the land slave trade. Such a system of action at intervals of a few weeks could not fail to be followed by results which would gratify and astonish every one in England. Mafia island, off Kismia Mafia, offers a capital rendezvous for the man-of-war during the absence of her launches; but if I may suggest any thing from my experience of this river, I would advise that those officers charged with this duty should consist of those who have experience and who have volunteered for this important duty; that one man-of-war should be appointed specially for this river work, properly equipped with a capacious steam vessel, which might navigate this stream without detriment to the good cause. A small stern-wheeler, which any English Thames ship-



builder could construct, drawing but eighteen inches of water, armed with one mountain steel seven-pounder and a couple of rocket tubes, with a crew of forty men, could forever solve the problem of how to stop the East African slave trade.

Captain Elton, in his official report to Captain Prideaux, acting political agent at Zanzibar, publishes the fact that a grand total of 4,096 slaves were marched by the overland route from Kilwa to Dar Salaam. I know nothing whatever of the accuracy of these figures, but I have already disclosed to you the whereabouts of the slave trader's tracks and have informed you what my explorations of the Rufiji suggest should be done to crush the now established land slave traffic.

I should not have been at such pains to find out what I have given you above if I did not feel from my soul that the government of Great Britain, which has expended such vast sums for the suppression of this slave trade, might, for the small sum of £5,000, begin to hope that her great mission in East Africa was approaching its successful accomplishment, and so enable all men to cry "*Laus Deo.*"

HENRY M. STANLEY.

### MR. STANLEY'S FOURTH LETTER.

## PREPARATION AND ORGANIZATION AT ZANZIBAR FOR THE EXPEDITION TO CENTRAL AFRICA.

[From the New York Herald of December 24, 1874.]

ZANZIBAR, *November 12, 1874.*

The expedition which bears the above title is about to commence its long journey into the heart of unexplored Africa, but before embarking on board the fleet of dhows which are anchored near by waiting for us I wish to employ a few hours in giving you some information respecting its organization, present intentions and prospects.

### STANLEY'S RESOLUTION FOR THE GREAT WORK.

Acquainted but too well with the dangers, the sicknesses, the troubles and annoyances which I shall have presently to encounter, since the burden of responsibility of the conduct of this expedition rests on

myself alone, I must confess to a slight feeling of joy at the prospect of immediate departure for the interior. I feel elated at the fact that I have been selected as the commander of this expedition, for the very fact of my selection argues that there is a being in existence something similar to me in form and appearance; and that this being who once was very much doubted has sufficient integrity and honesty to be chosen to repeat his journey to Africa. Though I had very many reasons for not undertaking a second journey to Africa, I was conscious that by the acceptance of this command I would compel those who doubted that I had discovered Livingstone at Ujiji to confess themselves in error; and the member of the Royal Geographical Society, who called me a "charlatan," to retract the libel. The few months I had spent in Ashantee with the British troops had not materially injured my health. At the same time they had not contributed much to establish that which had been impaired during my search after Livingstone. But without considering the wisdom of the proceeding or my powers to accomplish the duty I was preparing to perform, I sailed from England in command of the *Daily Telegraph* and *New York Herald* expedition, with the paramount idea in me that if I lived to return with good results my unjust enemies would be silenced forever. So much for myself and my hopes.

#### VOLUNTEERS FOR THE SERVICE.

Soon after the *Daily Telegraph's* publication of the fact that a new expedition was about to proceed to Africa under my command, I became the recipient of some hundreds of letters from volunteers who desired to assist and advise me in my undertaking. It would be no exaggeration to state that these applicants for position in this expedition considerably exceeded 1,200 in number. Probably 700 of them were natives of Great Britain; 300 were natives of America, and the balance might be distributed equally between France and Germany. Three of these volunteers were generals, five were colonels, several scores were captains and lieutenants in the army; about fifty applications came from officers in the navy, while the rest were civilians in various professions and walks of life, ranging from the civil engineer high in his profession and proficient in all acquirements, to the Liverpool cotton porter and New York boarding-house runner, who desired to see Africa, "having visited almost all parts of the world." The army and navy officers who applied were evidently gentlemen in earnest, far better qualified, perhaps, than I was for the

post of commander ; but, judging from their letters, I must confess that the majority of the civilians who applied for situations were madmen, and that the rest were fools, who knew nothing of what they boasted they could do. It may be that I use very harsh terms, but I speak the truth ; and, as the applicants shall be nameless, I do no harm. The unblushing falsehoods of these nameless applicants naturally disgusted me ; there were few of them who did not declare, on their honor, that they were up to every "dodge," had seen every thing and knew every thing. One madman proposed that I should take a balloon with me ; another a flying ship ; another proposed that he and I should go alone, disguised as negroes, and unarmed ; another desired me to take a tramway with me and a small locomotive, of which he would be the engineer ; another proposed that I should endeavor to establish an empire in Africa, which was a very easy thing to do, as he had read "Kaloolah," "Ned Gray," and "My Kalulu," and "knew all about it ;" while one, still more insane than any, suggested to me that, instead of taking guns and ammunition, and paying tribute to "nigger" chiefs, I should poison them off-hand. The Frenchmen and Germans were mainly commissioners of hotels, who, like the idiots I imagine them to be by their letters, volunteered to interpret for me at the various hotels I should happen to stop at in Africa. They were rich in recommendations, and could speak seven languages ; they were all prime travelers, and the only merit they possessed in my eyes was that they knew how to cook a "bef-tek" on occasion. To all these applicants I was naturally mutely impregnable ; but I may as well inform them all, through your columns, that I have with me three young Englishmen with whom I have every reason to believe I shall be perfectly satisfied, and that I bid them all a regretful farewell.

#### FRIENDS AT AND AFTER THE FAREWELL.

I never knew how many kind friends I could number until I was about to sail from England. The White Star line treated me in the most princely fashion ; gave me free passages to America and back. The Peninsular and Oriental company and the British India, through their courteous agents, showered courtesy after courtesy on me. Testimonials from hundreds of gentlemen were thrust on me, and invitations to dinner and parties, and to "spend a month or so in the country" were so numerous that if I could have availed myself of them in succession, years must elapse before any hotel need charge a

penny to my account. But, though my preparations for the journey monopolized my time and prevented me from doing any thing more than declining, with thanks, these manifold kindnesses, my numerous friends must believe that I am none the less grateful. I departed from England, August the fifteenth, loaded with good wishes, keepsakes, photographs, favors of all kinds, prouder of the knowledge that I had more friends than enemies than any prince or potentate can be of his throne or power.

#### BRACING UP AT ADEN.

At Aden I met my white assistants, whom I had dispatched from England, via Southampton, in charge of the dogs. The young Englishmen had quite got over all melancholy feelings, and were in prime spirits, though they entertained some doubt whether, if Central Africa was as hot as Aden, they should enjoy it very much. On my assuring them that they need fear nothing on the score of heat in Africa, they expressed themselves as relieved from their greatest fear. On the British India steamer *Euphrates* I was delighted to find that the Pocock brothers possessed several qualifications beyond those of sobriety, civility and industry. I discovered that they were capital singers and musicians, having belonged to some choir in their native town, where they were much esteemed.

#### THE WELCOME AT ZANZIBAR.

The delightful weather we experienced between Aden and Zanzibar was most grateful after the intense heat of Steamer Point, and we consequently arrived at Zanzibar on the twenty-second of September, almost as fresh and robust as when we left England. The next morning after I landed, some of my old friends of the former expedition heard of my arrival, and it was very gratifying to me to see the pleasure they manifested to one who had been so stern to them on certain occasions, when naught but sternness of the most extreme kind would have enabled me to overmaster a disposition they sometimes betrayed to be sullenly disobedient and mutinous. But they remembered, as well as I did, that though I was merciless when they were disposed to be wicked, I was as kind and as partial to them as Livingstone was when all went fair and well; and they knew that, when the rewards were distributed, that those who had behaved themselves as true men were not forgotten. The report that I had come was soon bruited through the entire length and breadth of the island, and Livingstone's

and my old dusky comrades gathered quickly about the house of my good host, Mr. Sparhawk, to pay their respects to me, and of course to receive heshimeh, or presents, with which, fortunately, I had provided myself before leaving England.

#### OLD FRIENDS AND PRESENT JUBILATION.

Here was Ulimengo, the incorrigible joker and hunter of the Search Expedition, with his mouth expanding gratefully on this day at the sight of a gold ring which encircled one of his thick black fingers, and a silver chain, which held an ornament, and hung down his broad and superb chest; and Rojab, who narrowly escaped destruction for immersing Livingstone's six years' journal in the muddy waters of the Mukondokwa, with his ebony face lighted up with the most extreme good-will towards myself for my munificent gift; and Man-was Sera also, the redoubtable ambassador of Speke and my most faithful messenger, who had once braved a march of 600 miles with his companion, Sarmine, in my service, and Livingstone's most faithful captain on his last journey; he was speechless with gratitude because I had suspended a splendid jet necklace to his neck, and encircled one of his fingers with a huge seal ring, which, to his mind, was a sight to see and enjoy.

Nor was the now historical Mabruki Speke — styled by Captain Burton "Mabruki the Bull-headed" — who has each time distinguished himself with white men as a hawk-eyed guardian of their property and interests — nor was Mabruki, I say, less enraptured with his presents than his fellows; while the courtly, valiant, faithful Chowperch — the man of manifold virtues, the indomitable and sturdy Chowperch — was as pleased as any with the silver dagger and gold bracelet and ear-rings which fell to his share.

His wife, whom I had purchased from the eternally wandering slave gang, and released from the harsh cold iron collar which encircled her neck, and whom I had bestowed upon Chowperch as a free woman for life, was, I discovered, the happy mother of a fine little boy, a little tiny Chowperch, who I hope will grow up to lead future expeditions to Africa, and be as loyal to white men as his good father has proved himself. Besides bestowing presents on the wife and child, Chowperch, who had heard that I had brought a wondrous store of medicine, entreated me that I should secure his son during his absence with me in Africa, against any visitation of the small-pox, which I hope I have done by vaccination.

## A DIALOGUE WITH THE "FAITHFULS."

Two or three days after, my arrival, a deputation of the "Faithfuls" came to me to learn my intentions and purposes. I informed them that I was about to make a much longer journey into Africa than formerly, and into very different countries from any that I had ever been into before, and I proceeded to sketch out to the astonished men an outline of the prospective journey. They were all seated on the ground before me, tailor fashion, eyes and ears interested, and keen to see and hear every word of my broken Kisawahili. As country after country was mentioned, of which they had hitherto but dimly heard, and river after river, lake after lake named, all of which I hoped, with their aid, to explore carefully and thoroughly, various ejaculations, expressive of emotions of wonder, joy and a little alarm, broke from their lips, but when I concluded each man drew a long breath, and almost simultaneously they uttered, in their own language, "Ah, fellows, this is a journey worthy to be called a journey!"

"But, master," said they, with some anxiety, "this long journey will take years to travel — six, nine or ten years."

"Nonsense," said I. "Six, nine or ten years. What can you be thinking of? It takes the Arabs nearly three years to go to Ujiji, it is true, but I was only sixteen months from Zanzibar to Ujiji and back to the sea. Is it not true?"

"Ay, true," answered they.

"Very well; and I tell you, further, that there is not enough money in this world to pay me for stopping in Africa ten, nine, or even six years; I have not come here to live in Africa; I have come here simply to see these rivers and lakes, and after I have seen them to return home."

"Ah, but you know the big master (Livingstone) said he was only going for two years, and you know that he was, altogether, nine years."

"That is true enough. Nevertheless, you know what I did before, and what I am likely to do again, if all goes well."

"Yes, we remember that you are very hot, and you did drive us until our feet were sore and we were ready to drop from fatigue. Wal-labi! but there never was such a journey as that from Unyanyembe home! No Arab or white man came from Unyanyembe in so short a time as you did. It was nothing but throw away this thing and that, and go on, go on, go on, all the time. Aye, master, that is true."

"Well, is it likely, then, when I marched so quick before that I am likely to be slow now? Am I much older now than I was then? Am I less strong? Do I not know what a journey is now? When I first started from Zanzibar to Ujiji I allowed the guide to show me the way; but when we came back who showed you the way? Was it not I, by means of that little compass which could not lie like the guide?"

"Aye, true, master; true, every word."

"Very well, then, finish these foolish words of yours and go and get me 300 good men like yourselves, and when we get away from Bagamoyo I will show you whether I have forgotten how to travel."

"Ay, Wallah, my master;" and, in the words of the Old Testament, "they forthwith arose, and went as they were commanded."

#### THE COMMAND ORGANIZED.

The result of our politic "talk," or "palaver," was witnessed shortly when the doors and gates of the Bertram agency and former consulate were thronged by volunteers, who were of all shades of blackness, and who hailed from almost every African tribe known. Waluyon, Wabera, Wagnido, Wanyanmezi, Wagogo, Wasegubha, Wasagara, Wabehe, Somali, Wagalia, Wanyassa, Wadirigo, and a score of other tribes, had their representatives, and each day added to the number, until I had hardly time to do any thing more than strive, with calmness and well-practiced patience, to elicit from them information as to who they were, what they had been doing, and whom they had served. The brave fellows who had accompanied Livingstone on his last journey, or myself, of course, had the preference, because they knew me, and fewer words were wanted to strike a bargain. Forty-seven of those who accompanied Livingstone on his last journey answered to their names, and 200 strangers, in whose fidelity I was willing to risk my reputation as a traveler, and nearly £1,000 sterling in advanced wages, were finally enlisted and sworn as escort and servants. Many of them will naturally prove recusants and malcontents, braggarts, cowards and runaways; but it cannot be helped; I have done all that I am able to do in providing against desertion and rascality. Where there is such a large number of wild people it would be absurd to hope that they will all be faithful and loyal to the trust and confidence reposed in them, or that a large expedition can be conducted thousands of miles without great loss.

The enlistment of the escort and preparations for the expedition were temporarily stopped during our exploration of the Rufiji river,

but on our return these were resumed with all vigor and dispatch. After the men, the armed escort and porters were secured, I devoted myself to examine the barter-goods which were necessary to procure sustenance in the far interior. I discovered, contrary to my expectations (for Mr. Clements Markham, secretary to the Geographical Society, had published the statement that these goods had risen in price since my departure from Zanzibar), that the barter goods were one per cent, and, in some instances, two per cent cheaper than they were purchasable formerly. Bales of American sheeting that cost me ninety-three dollars and seventy-five cents in 1871, I was now enabled to buy for eighty-seven dollars and fifty cents per bale, while the sami-sami beads, that formerly cost thirteen dollars the frasilah, now cost but nine dollars and seventy-five cents. This was very much in my favor; and after much consultation with the lately returned leaders of caravans upon the present prevailing fashion of beads and cloth among the distant tribes, I ordered the necessary stock of both, which, when piled up in portable bales and sacks, present quite an imposing and somewhat formidable pile.

#### RATE OF WAGES.

If cloth and beads and wire are cheaper than they were two years ago the hire of pagazis or porters is double. In 1871 and in 1872 I employed wanyanmezi and wanguara at the rate of two dollars and fifty cents per month each man; the same class of persons now obtain five dollars per month, and with some people I have had great difficulty to procure them at this pay, for they held out bravely for a week for seven and eight dollars per month. There must have been no lack of money, and somewhat inordinate liberality among those English gentlemen of the Cameron expedition, to have raised the hire of such men to double the former rate they were accustomed to. I hear that several of these men engaged with Cameron for seven and eight dollars per month, which, if true, only shows, too plainly, how the money has been expended. If each white traveler who intends penetrating Africa commits himself to such an injudicious proceeding as to double the rate of hire to which the pagazis and wanguara escort are accustomed, it will soon be impossible for any gentleman, unless those commissioned by a rich and generous government, to dare the venture. A moment's reflection on the expense which this liberality entails on him would show the traveler the unwisdom of liberality to strange men whom he knows nothing of previous to his journey. The time to be liberal is after the return, when the best



men can be discriminated from the worst, the very good from the indifferently good, and the steadily loyal fellows from the deserters. At such a time the reward is often considered to be as good as the wages, and should the traveler require them again at some future period, his judicious distribution of rewards will be found to have been remembered to his advantage. It has grown to be a custom now for servants, porters and escort to receive at least four months' pay in advance. Before starting from Bagamoyo I expect that the expedition will number 400 men. Each of these men, previous to his marching, will have received four pounds pay in advance, either in money or in cloth. The most prudent ask that their advance be given them in cloth. Those who have money require three days to spend it in debauchery and rioting, and in purchasing wives, while a few of the staid married men, who have children, will provide stores for their families.

#### FIRST DRAWBACKS.

On the morning of the fourth day, when the bugle sounds for the march, I need not be surprised if I find it a difficult task to muster the people together and that hours will be employed in hunting the laggards up and driving them on to our first camp, and very probably I shall find that at least fifteen or so have absented themselves altogether. This, of course, will be annoying, but it is well that I know that it is a probable thing and that I am in a measure prepared for such desertion. On the second day of the march I shall probably find myself minus ten more, which also will be annoying and exceedingly trying to the patience I have bottled up for the emergency. For several days longer there will be constant desertion by twos, threes and fours, but the losses will have to be borne and remedied somehow; and finally disease will break out, the result of their mad three days' debauchery, to be succeeded by small-pox, ulcerous sores, dysentery and fever and other diseases; and about this time, too, the white men will begin to suffer from strange languor of body and feverish pulse, and these, despite the rapidly diminishing force of carriers, will have to be transported on the shoulders of porters or on the backs of such asses as may be strong enough for such work; and the future of the expedition depends upon the way we shall be able to weather this stormy period, for the outlook at about this time will be sad indeed. Just think what a mournful jest a special correspondent of a rival newspaper might make of the Daily Telegraph and New York Herald expedition at this time, say three short weeks from the

coast! The magnificent caravan which started from the sea 400 strong, armed to the teeth, comfortable, well laden and rich, each armed man strong, healthy, well chosen, his skin shining like brown satin, eyes all aglow with pride and excitement, strong in his Snider rifle and twenty rounds of cartridges, his ax and knives; twelve stately, tall guides, tricked out in crimson jobo and long plumes, heading the procession, which is nearly a mile long, while brazen trumpets blow and blare through the forest, awakening the deep woods with their sounds and animating every soul to the highest pitch of hope. Ah, this was a scene worth seeing. But three weeks from now how different will be the greatly diminished caravan. Scores will have deserted, the strong will have become weak, the robust sick, the leader will be ready to despair and to wish that he had never ventured a second time into the sea of mishaps and troubles which beset the traveler in Africa. These are my anticipations, which are none of the brightest, you will allow. However, when the soldier has donned his helmet it is too late to deplore the folly which induced him to enlist.

#### THE "LIVINGSTONE" PONTOON.

Among other things which I convey with me on this expedition to make our work as thorough as possible is a large pontoon named the "Livingstone." A traveler having experience of the difficulties which prevent efficient exploration is not likely to enter Africa without being provided with almost every requisite likely to remove the great obstacles which lack of means of ferriage presents. After I had accepted the command of this second expedition I began to devise and invent the most portable kind of floating expedient or vehicle to transport baggage and men across streams and lakes to render me independent of the native chiefs. I thought of every thing I had seen likely to suit my purpose. Zinc tubes, such as the engineer department conveyed to the Prah in the late Ashantee war; canvas boats, such as Marcy, in his "Prairie Traveler," recommends; the devices and expedients suggested in "Art of Travel," India rubber boats, Irish wicker boats, etc., but every thing I thought of that previous travelers had experimented with were objected to by me on account of their weight and insufficient floating power. It is one of the most interesting things in African travel, among chains of lakes and numerous large rivers, to resolve the problem of navigating these waters safely and expeditiously without subjecting an expedition to the caprice and extortion of an ignorant savage chief or entailing upon yourself heavy expense for portage. As no carts or wagons can be

employed in conveying boats or zinc pontoons through the one-foot-wide paths, which are the channels of overland trade in Central Africa, zinc pontoons were not to be thought of. A zinc tube, eighteen inches in diameter and eight feet long, would form a good load for the strongest porter; but fancy the number of tubes of this zinc required to convey across a lake fifty miles wide a force of 300 men and about nine tons of baggage and material of an expedition; and what kind of a boat, such as we could carry with us, could transport such a number and weight across a stormy lake, at a moderately rapid rate of travel, a distance of from 1,000 to 2,000 miles?

After much anxious deliberation and ruin of much paper I sketched out a series of inflatable pontoon tubes, to be two feet in diameter and eight feet long, to be laid transversely, resting on three separate keels and securely lashed to them with two separate triangular compartments of the same depth, eight feet at the base, which should form the bow and stem of the inflatable boat. Over these several sections three lengthy poles were to be laid which should be lashed between each transverse tube to the three keels underneath. Above these upper poles laid lengthwise were to be bamboo poles, laid transversely, upon which the passengers and baggage might rest, without danger of foundering. After the design was fully matured the next thing to do was to find a manufacturer intelligent enough to comprehend what was required, and as J. C. Cording, of Piccadilly, London, had a good reputation among travelers, I tried him, and after a very few moments' conversation with the foreman of the shop, I was delighted to find that he perfectly understood what unusually strong material was requisite, and every part and portion of the design. I need only add that within a month I had in my possession the several parts and sections of this peculiar floating craft, beautifully and strongly made, in as complete and efficient order as would please the most fastidious traveler. All these several sections, when put in the scales, weighed 300 pounds, which, divided into portable loads of sixty pounds each, require but five men to carry the entire craft. No material can possibly equal this. If the strong, thick india rubber cloth is punctured or rent, Cording has supplied me with the material to repair it, and if all turns out as well with it as I strongly anticipate and hope it will, it must, of course, prove invaluable to me.

#### HIS NEW BOAT.

But an explorer needs something else, some other form of floatable structure, to be able to produce results worthy of a supreme effort at

penetrating the unknown parts of Africa. He must have a boat with him with which he may be enabled to circumnavigate lakes and penetrate long distances up and down rivers with a small and efficient body of men, while the main body is encamped at some suitable and healthy site. And what kind of a boat can be invented for the traveler such as he can carry thousands of miles, through bush and jungle and heat and damp and rain, without impairing its usefulness or causing him to regard it as an incumbrance? After various plans and designs I could think of nothing better than a light cedar boat, something after the manner and style of the Okonaga (Canada) cedar boat, but larger and of greater capacity. These Canadian boats are generally thirty feet in length and from five to six feet in width. They are extremely light and portable, and when near rapids are taken ashore and easily hoisted on the shoulders of six men and taken to smooth waters again. But a boat of this kind, though portable for short distances in Canada, would have to be constructed differently to be carried along the crooked narrow paths of African jungles. They would require to be built in water-tight sections, each section light enough to be carried by two men without distressing the bearers. Mr. James Messenger, of Teddington, near London, has a well-deserved reputation for building superb river boats, and while enjoying a Sunday near Hampton, witnessing the various specimens of his skill and workmanship, I came to the conclusion that Mr. Messenger would suit me. I had an interview with this gentlemen, and I laid my plans before him. I soon discovered that I was in the presence of a master workman, by the intelligent way he followed my explanations, though it was evident that he had not the slightest idea what an African jungle path was like. He understood what I meant by "portability," but his ideas of "portability" of any thing naturally suggested it on a broad highway, an English turnpike road, or at the utmost a path over treeless fields or commons. I doubt if even now the gentleman understands the horrors of a jungle path, with its intricate and never-ending crooked curves, beset on each side by a depth and intensity of vegetation through which we must struggle, and twist, and contort our bodies that we may pass through with our burdens, while the perspiration which streams from our brows almost blinds us, and causes us to grope and stumble and halt, like so many blind puppies, in that sickly, dull twilight which reigns there. To convey any thing very large, or wide, or high, or long, is out of the question through such a tangle and under such circumstances; and I must assume to myself the credit of having endeavored to describe

such a locality as vividly as my powers would enable me to the boat-builder. Mr. Messenger accepted the contract to build a boat of light, well seasoned cedar, forty feet in length and six feet in width, in five sections, each section of which was not to exceed more than 120 pounds in weight. I saw the boat after it was constructed, and before it was sawn up into sections, and her beautiful lines and the skilled workmanship lavished on her elicited at once from me unqualified praise and approbation. Before departing from his yard I suggested to Mr. Messenger that he should weigh her as she stood, and divide her, if he found her of greater weight than he or I anticipated, into sections not exceeding 120 pounds in weight.

This boat, completed and packed with care, followed me to Zanzibar by the next mail. When I opened the packages a perfect marvel of boat architecture was revealed; every bolt and nut worked perfect and free, and every one who saw the sections admired them. In a transport of joy I ordered the weighing scales to be rigged up, and each section weighed carefully. Four of the sections weighed 280 pounds avoirdupois, and one section weighed 310 pounds! The utter impossibility of rectifying this mistake in a place like Zanzibar made me despair at first, and I thought the best thing to do was to ship her back to England, and present her, with my compliments, to Mr. Messenger; but, upon inquiring for a carpenter, a young shipwright called Ferris was introduced to me and recommended for his intelligence. I exhibited the beautiful but totally unmanageable boat, and told him that in her present state she was useless to me and to everybody else, because she was too heavy and cumbersome, and that I could not carry her if I were paid five pounds per mile for doing so, and that time was short with me. I desired him to cut her down six inches, and subdivide each section, and to complete the work within two weeks, for that was the utmost time I could give him. To effect these improvements the two after sections had to be condemned, which would curtail the length considerably, and, of course, mar her beauty.

I can now congratulate myself (good Mr. Ferris having completed his work to my entire satisfaction), on possessing a boat which I can carry any distance without distressing the porters, with twelve men, rowing ten oars and two short paddles, and able to sail over any lake in Central Africa. I ought to state here that I do not blame Mr. Messenger for the mistake of sending me such unmanageable sections so much as I blame myself for not stopping over another month in

England to watch the construction of such a novelty as this kind of boat must necessarily be to a Thames boat builder.

#### SCIENTIFIC APPLIANCES.

As this expedition is for a different purpose to the former one with which I discovered Livingstone, I am well provided with the usual scientific instruments which travelers who intend to bring home results that will gratify scientific societies take with them. I have chronometers, sextants, artificial horizons, compasses, beam and prismatic; pedometers; aneroid barometers and thermometers; nautical almanacs for three years, hand leads and 1,000 fathoms sounding line with a very complete little reel, mathematical instruments, a planisphere, and a complete and most excellent photographic apparatus, and a large stock of dry plates. I have also half a dozen good timepieces, silver and gold, blank charts and every paraphernalia and apparatus necessary to bring home such results as will suit the most captious critic.

#### BAGAMOYO, THE STARTING POINT.

The east coast of Africa, from the mouth of the Juba river to the mouth of the Rouemna, possesses hundreds of good starting points for the unexplored interior, but the best, for many reasons, is the Bagamoyo. The present expedition is such a large and costly one, and so promises to be far the best organized and best equipped of any that ever left the sea-coast of East Africa for the purpose of exploration, that it would have been a great pity if it were wrecked or ruined just as it began to set out to fulfill its mission. To guard against the possibility of a total collapse, I have, after much deliberation, decided to start from Bagamoyo, and proceed some distance along the well-known caravan path, so as to give confidence to my men, and withdraw them as much as possible from the temptation to desert, and then plunge northward into the Masai land—a country as yet untrod by white men, and of the state of which the best informed of us are totally ignorant. It will be a risky undertaking, but not half as dangerous as starting for that country from some unknown seaport.

#### THE OBJECTIVE POINT.

My present intention is, then, to make my way westward to the Victoria Nyanza, and ascertain whether Speke's or Livingstone's hypothesis is the correct one—whether the Victoria Nyanza consists

of one lake or five lakes. All the most important localities will be fixed by astronomical observations, and whether the Victoria lake consists of one or many lakes, we shall discover by complete circumnavigation. When this work is finished, I intend to visit Metesa or Rumanika, and then cross over to the Lake Albert Nyanza, and endeavor to ascertain how far Baker is correct in his bold hypothesis concerning its length and breadth. On this lake I expect to meet Gordon and his party, by whom I hope to be able to send my first reports of my travels and discoveries since leaving the Unyanyembe caravan road.

Beyond this point the whole appears to me so vague and vast that it is impossible to state at this period what I shall try to do next. Whether Gordon circumnavigates the Albert or not, I shall most certainly do so if I reach it, and discover every detail about it to the best of my ability; but what I shall do afterwards will be best told after the circumnavigation of the Albert Nyanza.

#### HOPE.

What I may discover along this lengthy march I cannot at present imagine. I shall be equally pleased to corroborate either Speke's or Livingstone's hypothesis by actual personal observation and diligent exploration. I confess to you I have no bias either way. I would just as soon have the Victoria lake one vast sheet of water as I would have it distributed among five insignificant lakelets; and I am quite ready to corroborate Baker's dream of a connection between the Tanganyika and the Albert as I am to disprove it, if I find after its exploration that he is incorrect. I have no prejudice either way. Sir Samuel Baker's grand lake, however, is in more danger from Gordon than it is from me; for Gordon ought to be able, if all has gone well with him, to give the result of his decision long, aye, many months, before I can possibly reach the lake. It is fortunate for me that Gordon will be able to visit the Albert before I will, for Baker is so tenacious of his opinions that I fear it would be mere weariness of spirit to attempt to convince him that he was wrong; for which reason I should much prefer to be enabled to prove that his hypothetical sketch map of the Albert Nyanza is correct.

You may rest assured that as I journey along I shall avail myself of every opportunity to send my despatches to the coast, but after I leave the Unyanyembe road the first news you will receive from me will be, I hope, via the Nile.

HENRY M. STANLEY.

## STANLEY'S FIFTH LETTER.

## LIFE AND SCENES IN ZANZIBAR.

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[From the New York Herald of December 26, 1874.]

ZANZIBAR, EAST COAST OF AFRICA, *November 15, 1874.*

For the last four or five years the island and town called Zanzibar have been very prominent before the public. The rigorous measures pursued by the British government for the suppression of the slave trade on this coast and the appeals of Livingstone in behalf of the aboriginal African have made Zanzibar a well-known name. Previous to this time it was comparatively unknown — as little known, indeed, as the polysyllabic name by which it is described in the *Periplus of Arrian*. The mention of Zangnebar, Zangi-bar or, as it is now called, Zanzibar — produced very little interest. Some few people there were who remembered there was such a name in very large characters on the map of the world, occupying a large strip on the east side of Africa, during their schoolboy days, but what that name indicated or comprehended very few knew or cared. They thought that it might be a very wild land, peopled with cannibals and such like, no doubt; for I remember well, when I first returned from Africa, a great number of those kind who frequent clubs and big societies often asked me, "Where the deuce is Zanzibar?" There were people, however, who prospered and grew rich on the ignorance of their white brothers who were so wholly deficient in elementary geographical knowledge. These were the staid old merchants of London, New York, Salem and Hamburg, who had agents living at Zanzibar, who unobtrusively collected precious cargoes of African productions and shipped them home to their employers, who sold them again quietly and unobtrusively to manufacturers at enormous profits. Great sums of money were made for many, many years by these old merchants, until the slave trade question began to be agitated and Livingstone's fate to be a subject of inquiry. Then a committee of the House of Commons held a protracted sitting, sifting every item of information relating to the island and its prospects, its productions and commerce, etc., and the New York Herald despatched a special commissioner in search of Livingstone, one result of whose mission



was the publication of the name of Zanzibar far and wide. Captain Burton has also written two large volumes, which bear the conspicuous name of "Zanzibar," in large gold letters, on their backs; but very few of these volumes, I imagine, have found their way among the popular classes. I mean to try in this letter to convey a description of the island, its prince and such subjects as have relation to them, as will suit any mind likely to take an interest in reading it. De Horsey's "African Pilot" describes Zanzibar as being an island forty-six miles in length by eighteen miles in width at its greatest breadth, though its average breadth is not more than from nine to twelve miles. The "African Pilot" and None's "Epitome" place the island in south latitude  $6^{\circ} 27' 42''$ , and in east longitude  $39^{\circ} 32' 57''$ , but the combined navigating talent on board Her Britannic Majesty's surveying ship Nassau locates Zanzibar in south latitude  $6^{\circ} 9' 36''$ , and east longitude  $39^{\circ} 14' 43''$ . Between the island and the mainland runs a channel from twenty to thirty miles in width, well studded with coral islands, sand bars, sand banks and coral reefs.

#### FIRST APPEARANCE.

The first view the stranger obtains of Zanzibar is of low land covered with verdure. If he has been informed much concerning the fevers which trouble the white traveler in equatorial Africa, he is very likely to be impressed in his own mind that the low land is very suggestive of it, but a nearer view is more pleasing, and serves to dispel much of the vague fear or uneasiness with which he approached the dreaded region of ill-health and sorrow. The wind is gentle and steady which fills the vessel's sails; the temperature of the air is moderate, perhaps at  $70^{\circ}$  or  $75^{\circ}$  Fahrenheit; the sky is of one cærulean tint, the sea is not troubled and scarcely rocks the ship, the shore is a mass of vivid green, the feathery fronds of palm trees, and the towering globes of foliage of the mangrove relieve the monotony, while the gleaming white houses of the rich Arabs heighten the growing pleasure with the thought that the "fever may not be so bad as people say it is." Proceeding southward through the channel that separates Zanzibar from the Continent, and hugging the shore of the island, you will many times be gratified by most pleasant tropical scenes, and by a strange fragrance which is borne from the leaf-clad island—a fragrance which may remind you of "Ceylon's spicy isles." With a good glass you will be able to make out first the cocoa palm and the deep, dark green globe of foliage which the mango

raises above when the tree is in its prime, the graceful bombax, and the tall tamarind, while numbers of tall, gigantic trees of some kind loom above masses of umbrageous shrubbery. Bits of cultivated land, clusters of huts, solitary tembes, gardens, and large, square, white houses, succeed each other quickly until your attention is attracted by the sight of shipping in the distance, and, near by, growing larger and larger every moment, the city of Zanzibar, the greatest commercial mart on the east coast of Africa, Arrived in the harbor, you will find the ship anchors about 400 yards from the town, close to a few more European ships and perhaps a British man-of-war or two, while a number of queer-looking vessels, which you will style "native," lie huddled between your own vessel and the shore. These native vessels are of various tonnage and size, from the unwieldy Arab trading dhow, with two masts leaning inelegantly and slovenly toward the bows, while the towering after-part reminds you of the pictures of ships in the Spanish Armada, to the lengthy, low and swift-looking mpete, which, when seen going before the wind, seems to be skimming the sea like a huge white sea-gull. Beyond the native fleet of trading Muscat dhows, Kilwa slavers, Pangani wood-carriers and those vessels which carry passengers to the mainland, the town of Zanzibar rises from the beach in a nearly crescent form, white, glaring and unsymmetrical. The narrow tall, white-washed house of the reigning Prince Barghash bin Said, rises almost in the center of the first line of buildings; close to it on the right, as you stand looking at the town from shipboard, is the saluting battery, which numbers some thirty guns or thereabouts; and right behind rises a mere shell of a dingy old Portuguese fort, which might almost be knocked into pieces by a few rounds from Snider muskets. Close to the water battery is the German consul's house, as neat as clean white-wash can make an Arab building, and next to this house rises the double residence and offices of Her Britannic Majesty's Assistant Political Resident, surmounted by the most ambitious of flagstuffs. Next comes an English merchant's house, and then the buildings occupied by Mr. Augustus Sparhawk, the agent of the great house of John Bertram & Co., of Salem, Mass., and between the English merchant's house and the Bertram agency, in neighborly proximity, is seen the snow-white house of Mr. Frederick M. Cheney, agent of Arnold, Hines & Co., of New York, while beyond all, at the extreme right, in the extreme end of the crescent, on Shangani Point, towers in isolated vastness the English residency, which was formerly the house of Bishop Tozer and his scanty flock of youthful converts. If you start again

from that central and prominent point, the palace of his highness, and intend to take a searching view of the salient objects of observation along the sea-front of the town, you will observe that to the left of the water battery are a number of sheds roofed with palm fronds, and that in front of these is about the only thing resembling a wharf visible along the beach. This, you will be told, is the Zanzibar custom-house. There may be a native dhow discharging her cargo, and lines of burly, strong laborers come and go, go and come, continually, bearing to the custom-house bales, packages, ivory tusks and what not, and returning for fresh burdens; while, on the wharf, turbaned Arabs and long-shirted half-castes, either superintend the work or from idle curiosity stand and look on.

#### THE PALACE OF THE PRINCE OF BARGHASH.

Moving the eye leftward of the custom-house to a building of noble dimensions, you will see that mixture of richness of woodwork and unkempt slovenliness and general untidiness or semi-decay, which attracts the traveler in almost all large Turkish and Arab houses, whether in Turkey, in Egypt or Arabia. This is the new palace of Prince Barghash. The dark brown veranda, with its open lattice-work, interlaced bars of wood, infinitesimal carving — the best work of an Arab artisan — strike one as peculiarly adapted for a glowing climate like this of Zanzibar; but, if the eye surmounts this woodwork, it will find itself shocked at observing the half-finished roof and the seams of light which fall through it, and the dingy whitewash and the semi-ruinous state of the upper part of the structure. A little left of this stand two palatial buildings, which for size dwarf even the British residency. One is the house of Nassur bin Said, the prime minister of his highness; the other is inhabited by the Sultan's harem. Beyond these, large buildings are not many. The compact line of solid buildings becomes broken by unsightly sheds with thatched roofs. This is the Melinde quarter, a place devoted to the sale of fish, fruit, etc., to which new European arrivals are banished to seek residences among the few stone houses to be found there.

#### MALAGASH INLET.

Beyond Melinde is the shallow Malagash inlet, the cause — I may say the main cause, perhaps the only cause — of the unhealthiness of the town of Zanzibar; and beyond the Malagash inlet extends the country, like a rich, prolific garden, teeming with tropical plants and trees, sloping gently upward as far as the purpling ridges of Ebaysu.

## THE LANDING.

Such is Zanzibar and its suburbs to the new arrival, as he attempts to note down his observations from shipboard. Descending the side ladder, he is rowed ashore, and, if he has a letter of introduction, is welcomed by some "noble specimen of a British merchant," or an American merchant of thirty-five or forty years' standing, or a British official, or by one of those indescribables who has found his way into Zanzibar, and who patiently bides for the good time that is reported and believed to be coming; for I find that Zanzibar, instead of attracting the real merchant, has, since my last visit, but changed its European inutiles. When I was here before I met a living specimen of the happy and sanguine Micawber class. He is gone, but another fills his place. One can scarcely dare say anything good of Zanzibar, or of any other place without attracting the wrong class of persons; and, as I am on this topic, I may as well specify what class of persons can be benefited pecuniarily by immigration to Zanzibar.

## COMMERCIAL OPENINGS.

To an enterprising man of capital Zanzibar and the entire sea line of the Sultan's dominions offer special advantages. A man with a capital of £5,000 might soon make his £20,000 out of it; but not by bringing his capital and his time and health to compete with great, rich mercantile houses of many years' standing and experience, and settling at Zanzibar, vainly attempting to obtain the custom of the natives, who are perfectly contented with their time-honored white friends, when the entire coast line of the mainland invites his attention, his capital, his shrewdness and industry. The new arrival must do precisely what the old merchants did when they commenced business. He must go where there is no rivalry, no competition, if he expects to have a large business and quick returns for his money. He must bring his river steamer of light draught and penetrate the interior by the Rufiji, the Pangani, the Mtwana, or the Jub, and purchase the native product at first cost and resell to the large mercantile houses of Zanzibar or ship home. The copal of the Rufiji plain, accessible, as I know by experience, to a light draught steamer, is now carried on the shoulders of natives to Dar Salaam and Mbuamajii, to be sold to the Banians, who reship it to Zanzibar, and there resell to the European merchant. The ivory Unyamwezi is brought down close to Mbumi Usagara, which is accessible by a light draught steamer by the Wami. The ivory trade of the Masai and the regions north is carried down through a portion of the Pangani

valley, and the Pangani for a short distance is also navigable and furnishes a means of enabling the white merchant to overreach his more settled white brothers at Zanzibar. The Jub river, next to the Zambezi, is the largest river on the east coast of Africa, while it is comparatively unknown. Arab caravans penetrate the regions south of it and obtain large quantities of ivory and hides. Why should not the white merchant attempt to open legitimate trade in the same articles by means of the river? When John Bertram, of Salem, Mass., came to Zanzibar, some forty years ago, there was not a single European house here. He was an officer of a whaling vessel when he saw this large town, with its splendid opportunities for commencing a mercantile business. On arriving home he invested the results of his venture in chartering a small vessel with goods such as would meet with a ready sale in Zanzibar. The speculation turned out to be a good one. He repeated it, and then established an agency at Zanzibar, while he himself resided at Salem to conduct the business at home, to receive the cargoes from Zanzibar and ship cloth and other goods to his agency out here. The business which the young whaler started continued to thrive. Agent succeeded agent, as each man went home, after a few years' stay in Zanzibar, to enjoy the fruit of his labors. Boys sent out to Zanzibar to learn the business, became responsible clerks, then head agents, and subsequently opulent merchants; and so on from year to year, until John Bertram can point with noble pride to his own millions and the long list of noble men whom he taught, encouraged, sustained by his advice and enriched. The moral of all this is, that what John Bertram, of Salem, did at Zanzibar, can be done by any large-minded, enterprising Englishman or American on the mainland of Africa. Nay, as there is a larger field on the mainland, and as he can profit by the example of Bertram, he can do more.

#### HOW THEY LIVE.

Men experienced in the ways of oriental life need not be told in detail how people live in Zanzibar, nor how the town appears within, nor what the Arabs and half-castes and Wangwana know of sanitary laws. Zanzibar is not the best, the cleanest, nor the prettiest town I have ever seen; nor, on the other hand, is it the worst, the filthiest nor the ugliest town. While there is but little to praise or gratify in it, there is a good deal to condemn, and, while you condemn it, you are very likely to feel that the cause for condemnation is irremediable and hopeless. But the European merchants find much that is endur-

able at Zanzibar. It is not nearly the intolerable place that the smelted rocks of Aden have made Steamer Point, nor has it the par-boiling atmosphere of Bushire or Busrah, nor is it cursed by the merciless heat of Ismailia or Port Said. If you expose yourself to the direct rays of the sun of Zanzibar for a considerable time it would be as fatal for you as though you did such an unwise thing on the Aden Isthmus. Within doors, however, life is tolerable — nay, it is luxuriously comfortable. We (I mean Europeans) have numbers of servants to wait on us, to do our smallest bidding. If we need a light for our segars, or our walking cane, or our hats when we go out, we never think of getting these things for ourselves or of doing any thing of which another could relieve us of the necessity of doing. We have only the trouble of telling our servants what to do, and even of this trouble we would gladly be relieved. One great comfort to us out here is that there is no society to compel us to imprison our necks within linen collars, or half strangle ourselves with a silken tie, or to be anxious about any part of our dress. The most indolent of us never think of shifting our night pyjamas until nearly midday. Indeed, we could find it in our hearts to live in them altogether, except that we fear a little chaff from our neighbors.

Another luxury which we enjoy out here, which may not be enjoyed in Europe. What think you of a salt-water bath morning, noon and evening just before dinner? Our servants fill our tubs for us, for our residences stand close to the sea, and it is neither trouble nor expense, if we care at all for the luxury, to undress in the cool room and take a few minutes' sleep in the tub. Though we are but a small colony of whites, we resemble, microscopically, society at home. We have our good men and true and sociable men; we have large-hearted hospitable men, our pig-giving friends, our hail-fellows well met, and perambulating gossips. Our liquors and wines and segars are good, if they are not the best in the world. Some of us, of course, are better connoisseurs in such things than others, and have accordingly contrived to secure the most superior brands. Our houses are large, roomy and cool; we have plenty of servants; we have good fruit on the island; we enjoy health while we have it, and with our tastes, education and national love of refinement, we have contrived to surround ourselves with such luxuries as serve to prolong good health, peace of mind and life, and, Inshallah! shall continue to do so while we stay in Zanzibar. The above is but the frank, outspoken description of himself, as might be given by a dignified and worthy Zanzibar merchant of long standing, of European extraction; and

your commissioner will declare that it is as near truth as though the Zanzibar merchant of long standing and experience had written it himself.

#### THE POPULATION.

Now we have had the Europeans of Zanzibar, their houses and mode and law of life described, let us get into the streets and endeavor to see for ourselves the nature of the native and the Semitic resident, and ascertain how far they differ from the Anglo-Saxon and Anglo-American sublimities.

As we move away toward the Seyyid's palace we gradually become conscious that we have left the muddy streets with their small, narrow gutters, and which re-echoed our footsteps so noisily. The tall houses where the Europeans live, separated by but a narrow street, ten feet wide, shut out the heat and dazzling glare which otherwise the clean whitewashed walls would have reflected. When we leave these behind we come across the hateful glaring sunlight, and our nostrils become irritated by an amber-colored dust, from the "garbling" of copal and orchilla weed, and we are sensible of two separate smells which affect the senses. One is the sweet fragrance of cloves, the other is the odor which a crowd of slaves bearing clove bags exhale from their perspiring bodies. Shortly we come across an irregular square blank in the buildings which had hemmed us in from the sunlight. A fetid garbage heap, débris of mud-houses, sugar-cane leavings, orange and banana peelings, make piles which, festering and rotting in the sun, are unsightly to the eye and offensive to the nostrils. And just by here we see the semi-ruinous Portuguese fort, a most beggarly and dilapidated structure. Several rusty and antique cannon lie strewn along the base of the front wall, and a dozen or so of rusty and beggarly-looking half-castes, armed with long, straight swords and antique Muscat matchlocks, affect to be soldiers and guardians of the gate. Fortunately, however, for the peace of the town and the reigning prince, the prisoners whom the soldiers guard are mild-mannered and gentle enough, few of them having committed a worse crime than participating in a bloodless street brawl or being found intoxicated in the street.

#### RECEIVED AT COURT.

Passing the noisy and dusty custom-house, with its hives of singing porters at work, and herds of jabbering busybodies, nobodies and somebodies, we shortly arrive at the palace, where we might as well enter, and see how it fares with His Highness Barghash bin Said, the

Prince of Zanzibar and Pemba. As we may have merely made an appointment with him as private citizens of a free and independent foreign country, and are escorted only by a brother citizen of the same rank, etiquette forbids that the Seyyid should descend into the street to receive his visitor. Were we Her Britannic Majesty's consul or political resident his highness would deem it but due to our official rank to descend into the street and meet us exactly twenty-four steps from the palace door. Were we an envoy extraordinary the prince would meet us some fifty or seventy-five paces from his gate. We are but private citizens, however, and the only honor we get is an exhibition of the guards — Belooches, Persians and half-castes — drawn up on each side of the door, their uniforms consisting of lengthy butternut-colored dishdashes, or shirts which reach from the nape of the neck to the ankles of each.

After we have ascended a flight of steps we discover the prince, ready to receive us, with his usual cordial and frank smile and good natured greeting, and, during a shower of good natured queries respecting our health, we are escorted to the other end of the barely furnished room, where we are invited to be seated.

#### WHAT THE PRINCE SAID OF THE SLAVE TRADE.

I have had (adopting the first person singular again) a long conversation with the Prince of Zanzibar; but, omitting all extraneous matter, I shall only touch upon such portion of our conversation as relates to a subject in which we are all interested, viz.: — the slave trade and the diplomatic mission of Sir Bartle Frere.

We have all read the dispatches of Sir Bartle, relating his intercourse officially with the Sultan of Zanzibar; we have also heard from his own lips his views upon East African slavery. But none of your readers have heard the story of the Sultan himself, with his views of slavery and of the mission of Sir Bartle Frere. Without pretense of literal and exact record of what the Sultan said, I yet declare that the spirit of what he said will be found embodied in the following:—

“During Majid, my brother's time, Speke came here and traveled into Africa, and what he said about us Arabs caused us a little trouble. The consuls, too, have given us great trouble. Some have written home much that is not quite true; but some time ago my brother Majid died, and by the grace of God I succeeded him. The trouble which my brother Majid endured was as nothing compared to that



which has been the result of that man, Dr. Livingstone's letters. I maintain that those letters you brought from him and carried to England were the cause of all this great trouble. Indeed, I have had a troublous time of it ever since I came to the throne. First, there came the hurricane of two years ago (April, 1872) which destroyed my entire fleet and all the ships of my people, and devastated the island and the coast. We were well off before that time, and we became suddenly poor. I had seven ships and steamers of war lost, and my people lost about 200 ships, and if you doubt my word respecting the devastation on the land take one of my horses and ride out into the country that you may see for yourself. In the midst of the desolation and ruin which had overtaken us we heard that the former governor of Bombay, Sir Bartle Frere, was coming out to us to talk to us about the slave trade. Now, you white people must understand that all Arabs trade in slaves, that they have done so from the beginning. Our Koran does not say it is a sin, our priests say nothing against it, the wise men of Mecca say nothing against it; our forefathers traded in slaves, and we followed their footsteps and did likewise. But my father, Said Said, and my brothers, Thouweynee, Majid, and Toorkee, were friends with the English and the English gave them advice and got them to sign treaties not to trade in slaves any more. To the treaty that my brothers signed I gave my consent freely when I came to the throne, for I have always been a friend to the English and to Englishmen.

"When Sir Bartle Frere came here we were in sore distress and very poor. He asked me to sign a treaty that no slave trade should be permitted in my country. When I consulted my chiefs, they held their hands out to me and said, 'We have nothing, we are poor, but if the English will give us time, say a year or so, we are quite willing to sign that which they ask us.' I repeated to Sir Bartle what my chiefs were willing to do, and I asked him to give us time such as they gave the Portuguese; but Sir Bartle, in his hurry to get us to sign the treaty, overlooked the distress we were in from the hurricane. Time and time again I asked that he would give us but a few months to consider and prepare for this final stroke of misfortune, but he would not listen, he was deaf to me. Continually he said to me, 'Sign this treaty.' I was quite willing to sign it, though by signing it I was losing about \$20,000 a year revenue; but my people could not understand this haste of Sir Bartle Frere to get the treaty signed without giving us time to think of it. We knew that the English could do what they wanted to do in Zanzibar; if they took the island

we were too poor and weak to resist; if they destroyed us all we could not help it. All we could have done would have been to consign our cause to God and submit. Sir Bartle Frere went away angry. I cannot help it, but I grieve that he should be angry with me for what I could not help. One of the things he asked me to give my consent to was that I should assist the English in putting down the slave trade. How can I assist the English? I have no ships as I had formerly, or I would willingly do so.

"Soon after Sir Bartle Frere went away an English fleet came to our harbor. The English admiral (Rear Admiral Arthur Cumming) and Dr. Kirk came to see me about the orders they had received from the foreign office to stop the slave trade. They both advised me as friends to sign the treaty. I got my people's consent to do so, and I signed it, not because I was afraid of the English ships, for, if the English came to Zanzibar and said, 'We want this island,' I would not resist them, for I know that they are strong and I am weak, but because the English admiral and Dr. Kirk advised me as friends, for they knew my poverty and understood my case better than I could have told them."

#### WILL HE BE REIMBURSED?

Such is the story of the Sultan, without embellishment, and I dare say that Sir Bartle Frere will indorse most of it, if not all. It was a surprise to Sir Bartle's many admirers that his well known diplomatic talents had failed to secure the Sultan's signature to the treaty for the suppression of the slave trade, but with my knowledge of the method which Sir Bartle adopted to secure the sultan's signature I may say now that I no longer wonder at his failure. Small and insignificant as Prince Barghash may be in power and influence, he is yet an independent chief of an independent State, to whom are due all the little courtesies which skillful diplomats are in the habit of using to persons recognized as rulers; consequently the stern, relentless coercion which Sir Bartle's words and manners embodied could not be met in any other way by a man conscious of his dignity as sovereign prince than by a refusal to sign the treaty. The mild manners and suavity of Admiral Cumming, together with the tact and friendly entreaties of Dr. Kirk, however, produced the desired result, leaving us nothing to regret save the failure of Sir Bartle to succeed where he ought to have succeeded, and where he might have succeeded had he possessed his soul with patience. Now, however, that the treaty has been signed and England's indignation at the Seyyid's first refusal to con-

cede to her demands been appeased, strict justice requires that the prince shall in some measure be requited for the concession he made. This is not merely my opinion, nor is it merely my definition of what justice demands in this case; but it is the outspoken and frank declaration of several eminent English gentlemen with whom I have conversed. They say that the prince should be indemnified, for this concession on his part, with some grant of money or aid, in some form or another, for sacrificing to England's views of what is right and wrong an eighth portion of his revenue; that the plea that England may use, that she guaranteed Prince Barghash release from the annual subsidy of 40,000 crowns to his brother at Muscat, cannot be employed at all, as England herself had imposed this sum on the Zanzibar sultan in order that her commerce might not be endangered in the fratricidal war which might ensue on Prince Barghash's refusal to pay this heavy subsidy; and that it is doubtful whether Prince Toorkee could ever summon sufficient force to compel Prince Barghash to pay him a single coin. With which views just men will not fail to agree. The beggarly presents which Sir Bartle Frere and his suite brought to Zanzibar for presentation to the Sultan were unworthy of the nation, which no doubt intended to act generously, of the representative of her Britannic Majesty which conveyed them, and of the prince for whom they were purchased. Well enough, no doubt, for the petty potentate of Jobama, who ultimately received them, but not for the sovereign of Zanzibar and Pemba, and 1,000 miles of coast, with whom a British envoy was charged to negotiate. It is not common sense to suppose that any private citizen would look indulgently upon any proposition which required of him to sacrifice £4,000 a year of his income in consideration of a few paltry presents which did not exceed over a few hundred pounds in value at the most, any more than that Prince Barghash should. Yet this is precisely what Sir Bartle Frere was charged to do by the foreign office in his late mission to Zanzibar. Owing to the losses incurred by him and his people during the hurricane of 1872, and the sacrifice of a large portion of his revenue by the demands of England, the Prince of Zanzibar suffers from straitness of income and ready money. He has leased the customs to Jewram Sujee, a Banian, for a term of years, for a very insufficient sum. He is sorely troubled with the native war in Unyamwezi, which prevents the ivory from arriving at the sea. His private estates are mere wrecks of what they once were, and the real pecuniary condition of Prince Barghash may be summed up as truly deplorable. Now a present of two condemned

gunboats or any two vessels of war, such as the admiralty has almost always on hand for sale cheap for cash, would be a godsend to the Sultan of Zanzibar, and a round sum of a few thousands of pounds given to him as a sign of friendship and good will, might obviate, in some measure, the necessity of the large expense which England incurs annually in her laudable endeavors to suppress the slave trade.

There are several ways of regarding such a proposition, but it will not appear surprising to the candid reader, if he reads the above facts dispassionately and without prejudice. It is a good adage that which advises that we should choose the least evil of the two, and everybody will admit that if England could purchase the hearty coöperation of the Zanzibar sultan with a timely and needful present, in the philanthropic scheme which England has so long attempted to enforce on the east African coast, it would be less expensive than supporting a large squadron at an expense of several thousands of pounds per annum. And now that the slave trade is carried on inland it is more necessary than ever that Seyyid Barghash's good will should be secured. Without the aid that England could give the prince I doubt much that, however friendly disposed he may be, he can do any thing to assist in suppressing the trade, for the reasons already given.

#### A PEN AND INK SKETCH OF HIS HIGHNESS.

Turning again to other topics, I may as well sketch the prince before bowing him my adieu. He is now in the prime of life, probably about forty-two years old, of vigorous and manly frame, and about five feet nine inches in height. He is a frank, cordial and good natured gentleman, with a friendly brusqueness in his manner to all whom he has reason to regard with suspicion. He has an open, generous and very undiplomatic face, slightly touched here and there with traces of small-pox. He dresses plainly, and is not given to ostentation in any way. He wears the usual linen dress of the Arabs, with his waist cinctured by a rich belt of plaited gold, which supports the crooked dagger generally borne by an Arab gentleman. Over his linen dress he wears a long black cloth coat, the edges of which are covered with a narrow gold braid. His headdress is the usual ample turban of the Arab, wound about his head, and completing in his person a somewhat picturesque costume. It would be difficult to choose a prince with whom diplomatic relations could be carried on so easily, provided always that the diplomat remembered that the prince was an Arab and a Moslem gentleman. Politeness will always effect more than rudeness, with Arabian gentlemen. Admiral

Cumming, I feel sure, with his gentle, dispassionate bearing, could effect as much with Seyyid Barghash as Admiral Yelverton's courteous and calm bearing effected with the menacing ruffians of Cartagena. In whatever school of deportment these old British admirals, who, over a steely firmness, wear such courtesy, are brought up, it might be recommended that diplomats charged with delicate negotiations, might be sent to learn lessons of true politeness. There is, however, one phase in Prince Barghash's character which presents a difficulty in dealing with him, and that is his fanaticism. Ever since he undertook the journey to Mecca he has shown himself an extremely fervid Moslem, indisposed to do any thing or attempt any thing not recommended in the Koran. A prince of more liberal religious views might have had an opportunity during the late diplomatic negotiations of permanently bettering himself and people; but Barghash was restrained by his extreme religious scruples from asking any aid of England.

#### THE MART FOR TRADE.

Continuing our journey through the town of Zanzibar, beyond the sultan's palace, we come to the business quarter of the natives. The spicy smells, intermixed with those of fruit, printed cloth, oils, ghee, peppers, etc., grow stronger as we advance, added to which is the very infragrant odor which is exhaled from the bodies of the naked and unwashed multitude. Flies here congregate in swarms, and settle where they enjoy plentiful repasts. Down into the narrow and crowded alley, flanked by the low palm-roofed sheds where the humble, free and slave populace are engaged in their noisy barter, pours the merciless sunlight, drawing stifling vapors from the filthy and undrained street. Not caring to take more than a hasty glance at any thing under such circumstances, we hasten on through the most wretched alleys and streets, by half ruinous houses which only require to be repaired to be made presentable, and only require the superintendence of sanitary police to make them habitable; by low-roofed and square-pillared mosques and verandas, or burzanis, where squat dusky men and yellow men, kinky and straight-haired men, Arabs and Banians, Hindis and half-castes, each of whom we detect by either his garb or his appearance. And so we proceed by ruins and huts and dunghills, and garbage heaps, and square, dingy white buildings, until we come to the Malagash inlet, over which a bridge leads to a populous suburb and the evergreen country. If we cross the bridge and skirt the opposite bank by a broad, well-trodden path, we will be traveling along the base of a triangle, of which Shangani Point and

the British political residency may form the apex. A half hour's walk along this path leads us through ill-kept gardens, where mandioca or manioc (the cassava), Indian corn, and holcus, sesame and millet grow, half shaded by orange and lime, pomegranate and mango-palm and jack trees, until we halt before the white and clean buildings of the English Church mission. We have noted in our short walk that agricultural skill and industry is at a very low ebb, barely fit to be termed by such names, rather a wretched burrowing and shiftless slovenly planting; but the genial soil covers a multitude of defects — sins of indolence and unthriftiness.

#### THE CHRISTIAN DISPENSATION.

As we have arrived at the English Church mission buildings, what shall I say about the mission except the honest, truthful facts? The Right Rev. Bishop Tozer, "Bishop of Central Africa," in priestly purple and fine linen, is no more to be seen here, and it really appears as if the mission had begun new life, and had begun to lift its head among the useful societies of the world. As yet, I have seen no great increase of converts, but fair promise of future usefulness is visible everywhere. As a friend to the church which has sent this mission out, I was formerly restrained from saying much about it, because I knew very little good of it; and had I not seen the erudite but undignified prelate exhibiting himself in such unusual garb to the gaze of the low rabble of Zanzibar, I would certainly have passed the church mission and its pitiful ways of converting the heathen, in silence. Now, however, I may speak with candor. The great building now known as the British Residency was, in 1871 and 1872, the Episcopal palace and mission-house. After its sale to the English government, the missionaries removed their school to their country-house, a half mile or so beyond the extremity of Malagash inlet. With the money obtained by the sale of the mission-house, the superintendent purchased the old slave market — a vacant area surrounded by mud huts, close to the cattle yards of the Banians and the ooze and stagnant pools of the Malagash. On the site of so much extreme wretchedness and crime the church missionaries have commenced to erect structures which, when completed, may well be styled superb.

These buildings consist of a fine residence, a school and a church, which, with another building, just begun by Lacknindoss, the Banian, will surround an irregular square, in which palms and flowers and fruit trees will be planted. A view from one of the windows of the unfinished residence, gives us a clearer idea of the locality the mis-

sionaries have selected, and suggests grave doubts of the wisdom of its selection. Looking at it from a sentimental point of view, the locality is, no doubt, very appropriate, and a certain fitness is also seen in it. The British government denounced the slave trade, and made a grand effort to crush it; and the market for the sale of slaves in old times was purchased by the mission, on which the missionaries erect a church wherein peace and good will and brotherly love will be preached and taught. The neighborhood, also, is one of the most miserable quarters of Zanzibar; but the missionaries convey with them the power to improve, refine and elevate, despite its extreme poverty and misery. It is all very well, we think; but if we look from the windows and examine the character of the ground into which the walls of the building have been sunk, we will see that it is a quagmire, with putrid heaps of cow-dung and circular little pools of sink-water, which permeate through the corrupting soil, and heave up again in globules and bubbles, exhaling the vilest odor that ever irritated the civilized European's nose. And if what we have seen below is not enough to conjure up in the mind a dismal prospect of sickness and pain and sorrow for the unhappy missionaries who may be appointed to live here, the view of the long and broad stretch of black mud, which the shallow waters of the Malagash leave behind them for hours night and day, will certainly do it. It would require the treasury of a government to redeem the ground from its present uninhabitable state. All I can say, however, is that I can only hope that the dismal future suggested by the scenes near the mission buildings may never be realized, and that the worthy missionaries may be prosperous in the new field before them.

Dr. Steere, lately consecrated Bishop of Central Africa, is about to arrive here, as successor of Bishop Tozer. If report speaks correctly, he is about to establish mission buildings near Lake Nyassa, in which case he will have the hearty sympathy and support of every good man; and, did Livingstone live, Bishop Steere would depart with his blessings and best wishes for success. The very name of Bishop Steere suggests success. He is a practical and an indefatigably industrious man. He is devoid of bigotry, but while devoted to his church he does not neglect the great fact that conversion of the heathen means more than the mere teaching of the formula of the Church of England. In short, he is a fit leader, because of his plain, practical good sense, his industry, his intellectual acquirements and religion for the new Christian mission, and I heartily

congratulate the board of the church mission for their selection and choice of such a man. While we are almost certain that Bishop Steere will be able to show results worthy of him, it is absolutely necessary for the cause of religion throughout Africa that he should be properly supported by his friends at home. There must be no niggard supplies sent to him, for the establishment of such a mission as will insure success requires considerable resources, and the church mission should this time make a supreme effort worthy of their great church.

#### A RIDE TO ELAYSU — THE BLOOMING GARDEN OF THE LAND.

From the English mission to the country is but a step, and before closing this letter we should like to ask the reader to accompany us as far as the ridges of Elaysu. The path which we choose lies through cultivated tracts and groves of fruit trees which stretch on either side of it, thickening as they recede, and growing intensely deep and umbrageous, even to the depth and intensity of a forest. We note the sad effects of the hurricane in the prostrate and fast rotting trunks of the cocoanut palm, and the vast number of palms which lean from the perpendicular, and threaten before long to also fall. We note these things with a good deal of pity for the country, the people, and the poor unfortunate prince, and we also think what a beautiful and happy isle this isle of Zanzibar might be made under a wise and cultivated ruler. If such a change as is now visible in Mauritius, with all its peaks and mountains and miles of rugged ground, can be made, what might not be made of Zanzibar, where there are no mountains, nor peaks, nor rugged ground, but gentle undulations and low ridges eternally clothed in summer-green verdure. At every point, at every spot, you see something improvable, something that might be made very much better than it now is. And so we ride on with such reflections, which reflections are somewhat assisted, no doubt, by the ever-crooked path which darts toward all points of the compass in sudden and abrupt crookedness. But the land and the trees are always beautiful and always tropical. Palms and orange trees are everywhere, with a large number of plaintains, mangoes and jack-fruit trees; the sugar-cane is neighbor to the Indian corn, the cassava is side by side with the holcus sorghum, and there is a profusion of verdure and fruit and grain wherever we turn our eyes.

And shortly we arrive at the most picturesque spot on the island of Zanzibar — Elaysu or Ulayzu — as some call it — every inch of which, if the island were in the possession of the white man, would be



worth a hundred times more than it is now, from its commanding elevation, from the charming views of sea and land and town its summit presents, for its healthiness, its neighborhood to town, since it is but five or six miles off. What cosy, lovable, pretty cottages might be built on the ridge of Elaysu, amid palms and neverse foliage, amid flowers and carol of birds, amid shades of orange and mango trees! How white men and white women would love to dream on verandas, with open eyes, of their far away homes, made far pleasanter by distance and memory, while palms waved and rustled to gentle evening breezes, and the sun descended to the west amid clouds of all colors. Yes, Elaysu is beautiful, and the receding ridges, with their precipitous ravines, fringed with trees and vegetation, are extremely picturesque, and some short bits of scenery which we view across the white glaring bars of sunlight are perfectly idyllic in their modest beauty. But much as I would be pleased to dilate on this and that view to you, with all the varying tints and shadows, gleaming brightness and soft twilight, unsurpassed tropical scenes and continuous groves of trees, I am constrained for want of space to refuse. As we turn our horses' heads around to return, we view the town and harbor of Zanzibar charmingly somnolent in the pale gray haze through which they are seen, representing but too fitly, in that dreamy state in which we imagine them, the lassitude and indifference of the people of Zanzibar.

HENRY M. STANLEY.

## STANLEY'S SIXTH LETTER.

## THE MARCH TO USAGARA.

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[From the New York Herald of March 1, 1875.]

DISTRICT OF MPWAPWA, COUNTRY OF USAGARA, *Dec.*, 13, 1874.

Uncouth as the name of the district and the cluster of villages whence I date my letter may appear in writing, it is not at all discordant to the ear. Nay, the sweet voice of a *Msagara* damsel can even give it a pleasant sound, and, as near as I can make it, it ought to be written *Mbambwa*.

## RECOLLECTIONS OF THE PAST.

I can hardly describe my feelings as I revisited this spot after an absence of two years. I first experienced a sharp throb of regret as I recollected that it was the scene of the death of my Scotch assistant, William Farquhar, who perished here in 1871, and as I cast my eyes toward the west over the sere expanse and autumnal leafage of miles and miles of undulating plain, I verily believe that my next feeling was one of sorrowful foreboding at the momentary suggestion that perhaps one, if not all, of the white men on this expedition might find similar unhonored graves in this strange land. These feelings were not of long duration, however, for the cheery voices of the guides were heard loudly proclaiming that we were approaching *Mpwapwa*, and the view of high towering mountains, slopes all green with wide shadowing mimosa and tamarind, hollows dark with the verdant globes of foliage of sycamores, and the broad bed of the *Mpwapwa* stream, washed with crystal water, dispelled evil presentiments and all melancholy prognostications. Thoughts of misfortune and dark days to come fled like a sick man's fancies before the spring coloring of noble mountains and the refreshing verdure of well-watered slopes.

## CONSOLATION.

Honestly, no man has less right to begin a letter in this strain than I have; for no man, however lucky his star may be, has more right to be proud and happy and cheerful than I have this day. For I

have had an unprecedentedly successful march from the Indian Ocean, and surprisingly favorable influences have attended the expedition ever since we left Zanzibar. Nothing of the blight and misfortune that I predicted in my last letter from Zanzibar, nothing whatever of the vexatious delays, frequent desertions, half-hearted conduct of the armed escort, and various annoyances I surmised would befall us. On the contrary, we have arrived at the "half-way house" to Unyamwezi in an incredibly short time, as I will presently show you. We have suffered less sickness, less trouble, and, altogether, have had more good fortune than any expedition which ever came into Africa.

#### THE MARCH.

The expedition left Bagamoyo on the seventeenth of November, and arrived here yesterday, the twelfth day December, which makes a period of only twenty-five days! This fact, stated thus briefly, might not surprise those uninitiated with the usual time required for this march; but if I state that on my expedition in search of Livingstone, the same march occupied me fifty-seven days, and that it occupied Lieutenant Cameron's party four months, even the most superficial reader will not fail to perceive that I have every reason to be devoutly grateful and extremely cheerful. And, while considering this rate of speedy marching, it must be remembered that this is a very large expedition, bearing such cumbersome things as the pontoon Livingstone and the cedar boat Lady Alice, and that since leaving the coast we have been traveling along an entirely new route, much north of any yet adopted.

#### QUICK TIME.

Though I may look now with pleased expression on the distance traversed so speedily, as auguring well for the further prosecution of the march to the unknown lands north, and thence to the Nile sources, the day we left Zanzibar, with its wild disorder, did not promise much success. Nearly every member of the expeditionary force was either drunk, tipsy or elevated, or, as some would say, "a little the 'better' for the liquor." Many were absent from muster, and a few had deserted with their advance. I consoled myself with thinking, as I noticed the confusion and insolence of some of the most inebriated, "All right, my sable gentlemen; to-day is your day; to-morrow the reign of discipline and order begins."

## STRICT DISCIPLINE A POSITIVE NECESSITY — DEMORALIZATIONS UNDER THE SUN.

After disembarking at Bagamoyo matters were not mended. The men had not as yet, expended all their advance, and the consequence was that they betook themselves into the vile liquor shops of the Goanese at Bagamoyo, and after brutalizing themselves with the fire-water retailed there, they took to swaggering through the streets, proclaiming that they were white men's soldiers, maltreating women, breaking into shops and smashing crockery, some even drawing knives on the peaceable citizens, and in other ways indulging their worst passions.

Of course, as long as I remained at Bagamoyo, this state of things would continue; a few might be arrested and severely punished, but it would be too great a task to watch about 300 such men scattered about the houses of so large a town as Bagamoyo. I was so engrossed with the novel duties of suppressing turbulence and debauchery that I had not much time left for anything else. On the fifth day, however, after arriving at Bagamoyo, the bugle announced the march, and, although we had some trouble in collecting the laggards, by 9 A. M., the last man had left the town.

## AT SHAMBA GONERA,

my former first camp, the men manifested a disposition to stop, in order to make "one more night of it" at Bagamoyo; but by this time, as you may imagine, I had had enough of such scenes, and they were bodily driven on by the armed guard, not without considerable violence. Arriving at the Kingani river, the sections of the *Lady Alice* were screwed together, and her powers of transportation and efficiency were here well tested. I ascertained that the utmost she could bear in ferrying across the river were thirty men and thirty bales of cloth, or the weight of three tons, which was perfectly satisfactory to me. The Livingstone pontoon was not uncovered, as the *Lady Alice* proved expeditious enough in transporting the force across the river. When the ferriage was completed we resumed the journey, and long before sunset we encamped at Kikoka.

## THE INTEMPERATE MEN BREAK DOWN.

The intense heat of the Kingani plains, lying on either side, told severely on those men who were unaccustomed to traveling in Africa, and who had indulged their vicious propensities at Zanzibar and Bagamoyo before departure, which compelled us to remain a day at

Kikoka. I had, however, taken the precaution to leave a strong guard at the river to prevent the men from returning to Bagamoyo, and another on the hills between Bagamoyo and the Kingani plain, on the eastern side of the river, for a similar purpose.

#### A LETTER FROM THE GOVERNOR.

During the afternoon of this day, as I was preparing my last letters, I was rather surprised at a visit paid me in my camp from a party of the sultan's soldiers, the chief of whom bore a letter from the Governor of Bagamoyo, wherein he complained that my people had induced about fifteen women to abandon their masters.

On mustering the people and inquiring into their domestic affairs it was discovered that a large number of women had indeed joined the expedition during the night. Most of them, however, bore free papers accorded to them by the political agent at Zanzibar; but eleven were by their own confessions, runaway slaves. After being hospitably received by the Sultan of Zanzibar and the Arabs it was no part of a stranger's duty, unless authorized by some government likely to abide by its agent's actions, to countenance such a novel mode of liberating the slaves. The order was therefore given that these women should return with the sultan's soldiers; but, as this did not agree with either the views of the women themselves or their abductors, the females set up a determined defiance to the order, and the males seized their Snider rifles, vowing that they should not return. As such a disposition and demonstration of hostility was not politic nor calculated to deserve my esteem, or to win for me the Arab's good will, this disposition was summarily suppressed and the women returned to their masters.

#### CASTOR AND CAPTAIN.

The first victim on this expedition has been the noble mastiff Castor, presented to me by the Baroness Burdett Coutts, who died between the Kingani and Kikoka, from heat apoplexy. The second was the mastiff dog Captain, a very fine though ferocious animal, who died a few days after. I have still three dogs, the retriever Nero, the undaunted bulldog Bull and a well bred bull terrier Jack, who so far have borne the fatigues of the march very well, though the latter is considerably exercised in his mind by the numbers of grasshoppers he meets in the country while *en route*.

## ON THE SOUTHERN BANK OF THE WAMI.

Our course since leaving Rosako has been mainly north-west, until approaching Mpwapwa we traveled due west. For several days we journeyed along the southern bank of the Wami river, making the discovery that the Wami can never be navigable during the dry season, as its channel for many miles is choked with granite boulders. During the rainy season very large crafts could ascend as far as the Usagara mountains; there is a rise of over sixteen feet in the river. On crossing the Wami we entered Nguru, which is north of Usegubba, a country studded with tall peaks and mountains, the highest of which is a truncated cone, Mount Kidudwe, having an altitude of about 12,000 feet above the sea. As we journeyed through Nguru we crossed the several tributaries of the Wami which are the Mwehweh the Mkindo, the Myomero, the Usingwe, the Rudewa and Mukondokwa.

## IN NORTHERN USAGARA.

From Nguru we entered Northern Usagara, over ground which the aneroids indicated was 4,475 feet above sea level. Then we descended into lower ground about 3,400 feet above sea level until we came to Mpwapwa, which I have ascertained has an altitude, according to boiling point and two barometers, of 3,575 feet.

Three days from here we crossed three tributaries of some river flowing east, north of the Wami, which may probably be the Pangani.

## SCIENTIFIC OBSERVATIONS.

The most extreme north which we reached on our journey here from the coast has been south latitude  $5^{\circ} 40'$  which I ascertained by taking double altitudes. This was at the village of Kitangeh.

We intend to prosecute our journey to-morrow, but before leaving the Unyanyembe road for the land of discoveries and the sources of the Nile, which I am eager to reach, I will drop you a short letter informing you of our march through inhospitable Ugogo.

HENRY M. STANLEY.

P. S.—I have omitted to state that the white men, Edward and Francis Pocock and Fred Barker, are enjoying excellent health and spirits. The three have gone through their seasoning fevers without much trouble.

## STANLEY'S SEVENTH LETTER.

THE MARCH FROM USAGARA TO THE VICTORIA NIYANZA AND  
HARD FIGHTING.

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[From the New York Herald of October 11, 1875.]

VILLAGE OF KAGEHYI, DISTRICT OF UCHAMBI, USUKUMA, {  
ON THE VICTORIA NIYANZA, *March 1, 1875.* }

The second part of the programme laid before me as commander of the Anglo-American Press Expedition to perform, ended successfully at noon on the 27th February, 1875. The great lake first discovered by Captain Speke, the Victoria Nyanza, was sighted and reached by us on that day; and it is with the feeling of the most devout gratitude to Almighty God for preserving us, amid manifold perils that I write these lines.

It seems an age since we departed from Mpwapwa, Usagara, whence I despatched my last letter to you. We have experienced so much, seen and suffered so much, that I have to recapitulate carefully in my memory and turn to my note book often to refresh my recollections of even the principal events of this most long, arduous and eventful march to the Victoria Nyanza.

I promised you in my last letter that I would depart as soon as practicable from the old route to Unyanyembe, which is now so well known, and would, like the patriarch Livingstone, strike out a new line to unknown lands. I did so, but in our adventurous journey north I imperilled the expedition and almost brought it to an untimely end, which, happily for me, for you and for geographers, a kindly Providence averted.

## VICISSITUDES OF TRAVEL

On leaving Mpwapwa we edged northward across the desert of the Marenga Mkali, or the Bilber water, leaving the vain chief of Mbumi far to the south, and traversed northern Ugogo with the usual success attending travelers in southern Ugogo. The chiefs practiced the usual arts to fleece us of property and blackmailed us at every opportunity. Now, we met chiefs more amiably disposed toward strangers to pay heavier tribute in other chiefs' lands. We crossed broad and

bleak plains, where food was scarce and cloth vanished fast, to enter hilly districts where food was abundant, the people civil and the chiefs kind. We traversed troublesome districts, where wars and rumors of wars were rife, the people treacherous and hostile, to enter countries lying at the mercy of the ferocious Wahumba on the north, and the Wahebe to the south. Thus good and evil fortune alternated during our travels through Ugogo, an epitome in brief of our after experiences. Furious rainy tempests accompanied us each day, and some days both nature and man warred against us, while on other days both seemed combined to bless us. Under our adverse fates the expedition seemed to melt away; men died from fatigue and famine, many were left behind sick, while many, again, deserted. Promises of reward, kindness, threats, punishments, had no effect. The expedition seemed doomed.

#### HEROIC ENGLISHMEN.

The white men, though selected out of the ordinary class of Englishmen, did their work bravely; nay, I may say, heroically. Though suffering from fever and dysentery, insulted by natives, marching under the heat and equatorial rain storms, they at all times proved themselves of noble, manful natures, stout-hearted, brave men, and — better than all — true Christians. Unrepining they bore their hard fate and worse fare; resignedly they endured their arduous troubles, cheerfully performed their allotted duties, and at all times commended themselves to my good opinion.

The western frontier of Ugogo was reached on the last day of 1874. We rested two days, and thence struck direct north, along an almost level plain, which some said extended as far as Nyanza. We found by questioning the natives that we were also traveling along the western extremity of Whunba, which we were glad to hear, as we fondly hoped that our march would be less molested.

Two days' march north brought us to the confines of Usandawi, a country famous for elephants; but here our route inclined north-west, and we entered Ukimba or Uyanzi, at its north-eastern extremity.

#### FAITHLESS GUIDES.

We had hired guides in Ugogo to take us as far as Iramba; but at Muhalala, in Ukimbu, they deserted. Fresh guides were engaged at Muhalala, who took us one day's march farther north-west, but at night they also deserted, and in the morning we were left on the edge of a wide wilderness without a guide. On the roads the previous day the



guides had informed us that three days' march would bring us to Urimi, and relying on the truth of the report, I had purchased two days' provisions, so that this second desertion did not much disconcert us nor raise any suspicion, though it elicited many unpleasant remarks about the treachery of the Wagogo. We, therefore, continued our march, but on the morning of the second day the narrow, ill-defined track which we had followed became lost in a labyrinth of elephant and rhinoceros trails. The best men were dispatched in all directions to seek out the lost road, but they were all unsuccessful, and we had no resource left but the compass. The day brought us into a dense jungle of acacia and euphorbias, among which we had literally to push our way through by scrambling, crawling along the ground under natural tunnels of embracing shrubbery, cutting the convolvuli and creepers, thrusting aside stout thorny bushes, and, by various detours, taking advantage of every slight opening the jungle afforded, which naturally lengthened our journey and protracted our stay in the wilderness. On the evening of the third day the first death in the wilderness occurred.

#### HUNGER AND THIRST.

The fourth day's march lasted nearly the whole day, though we made but fourteen miles, and was three-fold more arduous than that of the preceding day. Not a drop of water was discovered during the march, and the weaker people, laboring under their loads, hunger and thirst, lagged behind the vanguard many miles, which caused the rear guard, under two of the white men, much suffering. As the rear guard advanced they shouldered the loads of the weaker men, and endeavored to encourage them to resume the march. Some of these men were enabled to reach the camp, where their necessities were relieved by medicine and restoratives. But five men strayed from the path which the passing expedition had made, and were never seen alive again. Scouts sent out to explore the woods found one dead about a mile from the road; the others must have hopelessly wandered on until they also fell down and died.

The fifth day brought us to a small village, lately erected, called Uveriveri, the population of which consisted of four men, their wives and little ones. These people had not a grain of food to spare. Most of the men of our expedition were unable to move for hunger and fatigue. In this dire extremity I ordered a halt and selected twenty of the strongest men to proceed to Suna, twenty-nine miles north-west from Uveriveri, to purchase food. In the interval I

explored the woods in search of game, but the search was fruitless, though one of my men discovered a lion's den and brought me two young lions, which I killed and skinned.

Returning to camp from my fruitless hunt I was so struck with the pinched faces of my poor people that I would have wept heartily could I have done so without exciting fear of our fate in their minds, and I resolved to do something toward relieving the pressing needs of fierce hunger.

#### MAKING GRUEL IN A TRUNK.

To effect this a sheet-iron trunk was emptied of its contents, and being filled with water was placed on the fire. I then broke open our medical stores and took five pounds of Scotch oatmeal and three tins of revalenta arabica, with which I made gruel to feed over 200 men. Oh, it was a rare sight to see these poor famine-stricken people hasten to that Torquay dress-trunk and assist me to cook that huge pot of gruel, to see them fan the fire to a fiercer heat, and, with their gourds full of water, stand by to cool the foaming liquid when it threatened to overflow; and it was a still more rare sight to watch the pleasure steal over their faces as they drank the generous food. The sick and weaker ones received a larger portion near my tent, and another tin of oatmeal was opened for their supper and breakfast. But a long time must elapse before I shall have the courage to describe my feelings during the interval I waited for the return of my people from Suna with food, and fruitless would be the attempt to describe the anxiety with which I listened for the musketry announcing their success.

#### TIMELY RELIEF.

After forty-eight hours' waiting we heard the joyful sounds, which woke us all into new life and vigor. The food was most greedily seized by the hungry people, and so animating was the report of the food purveyors that the soldiers, one and all, clamored to be led away that afternoon. Nowise loth myself to march away from this fatal jungle, I assented; but two more poor fellows breathed their last before we left camp.

We camped that night at the base of a rocky hill, overlooking a broad plain, which, after the intense gloom and confined atmosphere of the jungle, was a great pleasure to us, and next day striking north along this plain, after a long march under a fervid sun of twenty miles, reached the district of Suna, in Urimi.

## A STRANGE PEOPLE.

In Urimi, at Suna, we discovered a people remarkable for their manly beauty, noble proportions and nakedness. Neither man nor boy had either cloth or skins to cover their nudity; the women bearing children only boasted of goat skins. With all their physical beauty and fine proportions, they were the most suspicious people we had yet seen. It required great tact and patience to induce them to part with food for our cloth and beads. They owned no chief, but respected the injunctions of their elders, with whom I treated for permission to pass through their land. The permission was reluctantly given, and food was begrudgingly sold, but we bore with this silent hostility patiently, and I took great care that no overt act on the part of the expedition should change this suspicion into hatred.

Our people were so worn out with fatigue that six more poor fellows died here, and the sick list numbered thirty. Here, also, Edward Pocock fell seriously ill of typhoid fever. For his sake, as well as for the other sufferers, *I halted in Suna four days*; but it was too evident that the longer we stayed in their country the natives regarded us with less favor, and it was incumbent on us to move, though much against my inclination. There were many grave reasons why we should have halted several days longer, for Edward Pocock was daily getting worse, and the sick list increased alarmingly; dysentery, diarrhœa, chest diseases, sore feet, tasked my medical knowledge to the utmost; but prudence forbade it. The rear guard and captains of the expedition were, therefore, compelled to do the work of carriers, and every soldier, for the time being, was converted into a *pagazi*, or porter. Pocock was put into a hammock, the sick and weakly were encouraged to do their utmost to move on with the expedition to more auspicious lands, where the natives were less suspicious, where food was more abundant, and where cattle were numerous. Imbued with this hope, the expedition resumed its march across the clear, open and well cultivated country of Urimi.

## POCOCK BREATHES HIS LAST.

We reached Chiwyu about ten o'clock, after a short march, and here the young Englishman, Edward Pocock, breathed his last, to the great grief of us all. According to two rated pedometers we had finished the 400th mile of our march from the sea, and had reached the base of the watershed whence the trickling streams and infant waters begin to flow Nileward, when this noble young man died.

We buried him at night, and a cross cut deep into a tree marks his last resting place at Chiwyu.

The farther we traveled north we became still more assured that we had arrived in the dewy land whence the extreme southern springs, rivulets and streams discharge their waters into the Nile. From a high ridge overlooking a vast extent of country the story of their course was plainly written in the deep depressions and hollows trending northward and north-westward, and as we noted these signs of the incipient Nile we cherished the darling hope that before long we should gaze, with gladdened eyes, on the mighty reservoir which collected these waters, which purled and rippled at our feet, into its broad bosom, to discharge them, in one vast body, into the White Nile.

From Chiwyu we journeyed two days through Urimi to Managara, where Kaif Halleck — the carrier of Kirk's letter bag to Livingstone, whom I compelled to accompany me to Ujiji in 1871 — was brutally murdered. He had been suffering from asthma, and I had permitted him to follow the expedition slowly, the rear guard being all employed as carriers because of the heavy sick list, when he was waylaid by the natives and hacked to pieces. This was the first overt act of hostility on the part of the Warimi. Unable to fix the crime on any particular village, we resumed our journey, and entered Iturn, a district of northern Urimi, on the twenty-first of January.

#### THE LEEWUMBU RIVER.

The village near which we camped was called Vinyata, and was situated in a broad and populous valley, containing, probably, some 2,000 or 3,000 souls. Here we discovered the river which received all the streams that flowed between Vinyata and Chiwyn. It is called here Leewumbu, and its flow from this valley was west. Even in the dry season it is a considerable stream, some twenty feet in width and about two feet deep, but in the rainy season it becomes a deep and formidable river.

The natives received us coldly, but as we were but two day's journey from Iramba I redoubled my exertions to conciliate the surly suspicious people, and that evening my efforts seemed crowned with success, for they brought milk, eggs and chickens to me for sale, for which I parted freely with cloth. The fame of my liberality reached the ears of the great man of the valley, the magic doctor, who, in the absence of a recognized king, is treated with the deference and respect due to royalty by

the natives. This important personage brought me a fat ox on the second day of my arrival at Vinyata, and in exchange received double its value in cloth and beads, and a rich present was bestowed upon his brother and his son. The great man begged for the heart of the slaughtered ox, which was freely given him, and other requests were likewise honored by prompt gifts.

We had been compelled to take advantage of the fine sun which shone this day to dry the bales and goods, and I noticed, though without misgiving, that the natives eyed them greedily. The morning of the third day the magic doctor returned again to camp to beg for some more beads to make brotherhood with him. To this, after some slight show of reluctance to give too much, I assented, and he departed apparently pleased.

#### THE WAR CRY OF THE WATURU.

Half an hour afterward the war cry of the Waturu was heard responding through each of the 200 villages of the valley of the Leewumbu. The war cry was similar to that of the Wagogo, and phonetically it might be spelt "hehu, a hehu," the latter syllables drawn out in a prolonged cry, thrilling and loud. As we had heard the Wagogo sound the war notes upon every slight apparition of strangers we imagined that the warriors of Ituru were summoned to contend against some marauders like the warlike Mirambo or some other malcontent neighbors, and, nothing disturbed by it, we pursued our various avocations, like peaceful beings, fresh from our new brotherhood with the elders of Ituru. Some of our men were gone out to the neighboring pool to draw water for their respective messes, others were gone to cut wood, others were about starting to purchase food, when suddenly we saw the outskirts of the camp darkened by about 100 natives in full war costume. Feathers of the bustard, the eagle and the kite waved above their heads, or the mane of the zebra and the giraffe encircled their brows; their left hands held their bows and arrows, while their right bore their spears.

This hostile presence naturally alarmed us, for what had we done to occasion disturbance or war? Remembering the pacific bearing of Livingstone when he and I were menaced by the cannibal Wabembe, I gave orders that none should leave camp until we should ascertain what this warlike appearance meant, and that none should, by any demonstration, provoke the natives. While we waited to see what the Waturu intended to do, their number increased ten-fold and every bush and tree hid a warrior.

## THE CAMP SURROUNDED.

Our camp was situated on the edge of a broad wilderness, which extended westward many days' march; but to the north, east and south, nothing was seen but villages and cultivated ground, which, with the careless mode of agriculture in vogue among savages, contained acres of dwarf shubbery; but I doubt whether throughout this valley a better locality for a camp could have been selected than the one we had chosen. Fifty or sixty yards around us was open ground so that we had the advantage of light to prevent the approach of any enemy unseen. A slight fence of brush served to screen our numbers from those without the camp, but, having had no occasion to suspect hostilities, it was but ill to shield us from attack.

When the Watura were so numerous in our vicinity that it was no longer doubtful that they were summoned to fight us, I despatched a young man who knew their language to ascertain their intention. As he advanced towards them six or seven warriors drew near to talk with him. When he returned he informed us that one of our men had stolen some milk and butter from a small village and that we must pay for it in cloth. The messenger was sent back to tell them that white men did not come to their country to rob or quarrel; that they had but to name the price of what was stolen to be paid at once, and that not one grain of corn or millet-seed should be appropriated by us wrongfully. Upon this the principal warriors drew nearer, until we could hear their voices plainly, though we did not understand the nature of the conversation. The messenger informed us that the elders demanded four yards of sheeting, which was about six times the value of the stolen articles; but at such time it was useless to haggle over such a demand, and the cloth was paid. When it was given to them the elders said they were satisfied, and withdrew.

## HOSTILITIES BEGUN.

But it was evident that though the elders were satisfied the warriors were not, as they could be seen hurrying by scores from all parts of the valley and gesticulating violently in crowds. Still we waited patiently, hoping that if the elders and principal warriors were really amicably disposed toward us, their voices would prevail, and that they would be able to assuage the wild passions which now seemed to animate the others. As we watched them we noted that about 200 detached themselves from the gesticulating crowds east of the camp and were hurrying to the thick bush west of us. Soon afterward one

of my men returned from that direction bleeding profusely from the face and arm, and reported that he and a youth named Sulieman were out collecting fire-wood when they were attacked by a large crowd of savages, who were hidden in the bush. A knobstick had crushed his nose and a spear had severely wounded him in the arm, but he had managed to escape, while Sulieman was killed, a dozen spears having been plunged into his back.

This report and the appearance of the bleeding youth so excited the soldiers of the expedition that they were only with the utmost difficulty restrained from beginning a battle at once. Even yet I hoped that war might be prevented by a little diplomacy, while I did not forget to open the ammunition boxes and prepare for the worst. But much was to be done. The enclosure of the camp required to be built up, and something of a fortification was needed to repel the attack of such a large force. While we were thus preparing without ostentation to defend ourselves from what I conceived to be an imminent attack, the Waturu, now a declared enemy, advanced upon the camp, and a shower of arrows fell all around us. Sixty soldiers, held in readiness, were at once ordered to deploy in front of the camp, fifty yards off, and the Waugwana, or free men of Zanzibar, obedient to the command, rushed out of the camp, and the battle commenced.

#### FORTIFYING THE CAMP.

Immediately after these, sixty men with axes were ordered to cut bushes and raise a high fence of thorn around the camp, while twenty more were ordered to raise lofty platforms within, like towers, for sharpshooters. We busied ourselves in bringing the sections of the *Lady Alice* to make a central camp for a last resistance and otherwise strengthening the defenses. Every one worked with a will, and while the firing of the skirmishers, growing more distant, announced that the enemy was withdrawing from the attack, we were left to work unmolested. When the camp was prepared I ordered the bugler to sound the retreat, in order that the savages might have time to consider whether it was politic for them to renew the fight.

When the skirmishers returned they announced that fifteen of the enemy were killed, while a great many more were wounded and borne off by their friends. They had all distinguished themselves — even “Bull” the British bulldog, had seized one of the Watura by the leg and had given him a taste of the power of the English canines of his breed before the poor savage was mercifully despatched by a Snider bullet.

We rested that day from further trouble, and the next morning we waited events until nine o'clock, when the enemy appeared in greater force than ever, having summoned their neighbors all about them to assist them (I felt assured now) in our ruin.

#### FIGHTING RENEWED.

But, though we were slow to war with people whom I thought might be made friends the previous day, we were not slow to continue fighting if the natives were determined to fight. Accordingly I selected four experienced men to lead four several detachments, and gave orders that they should march in different directions through the valley and meet at some high rocks distant five miles off; that they should seize upon all cattle and burn every village as soon as taken. Obedient to the command they sallied out of the camp and began the second day's fight.

They were soon vigorously engaged with the enemy, who fled fast and furions before them to an open plain on the banks of the Lee-wumbu. The detachment under Farjalla Christie became too excited, and because the enemy ran imagined that they had but to show themselves to cause the natives to fly; but once on the plain — having drawn them away isolated miles from any succor — they turned upon them and slaughtered the detachment to a man, except the messenger, who had been detailed to accompany the detachment to report success or failure. I had taken the precaution to send one swift-footed man to accompany each detachment for this purpose. This messenger came from Farjalla to procure assistance, which was at once dispatched though too late to aid the unfortunate men, but not too late to save the second detachment from a like fate, as the victorious enemy, after slaughtering the first detachment, had turned upon the second with the evident intention to cut the entire force opposed to them in detail. When the support arrived they found the second detachment all but lost. Two soldiers were killed. The captain, Ferahan, had a deep spear wound in his side. The others were hemmed in on all sides. A volley was poured into the rear of the astonished enemy, and the detachment was saved. With their combined forces our people poured a second volley, and continued their march almost unopposed to the northern and eastern extremity of the valley. Meanwhile, smoke was seen issuing from the south and south-east, informing us that the third and fourth detachments were pursuing their way victoriously, and soon a score or more of villages were enwrapped in dense volumes of smoke. Even at a distance of



eight miles we beheld burning villages, and shortly after fired settlements to the north and east announced our victory on all sides.

Toward evening the soldiers returned, bringing cattle and an abundance of grain to the camp; but when the muster-roll was called I found I had lost twenty-one men, who had been killed, while thirty-five deaths of the enemy were reported.

#### THE THIRD DAY'S BATTLE.

The third day we began the battle with sixty good men, who received instructions to proceed to the extreme length of the valley and burn what had been left the previous day. These came to a strong and large village on the north-east, which, after a slight resistance, they entered, and, loading themselves with grain, set on fire. Long before noon it was clearly seen that the savages had had enough of war and were demoralized, and our people returned through the now silent and blackened valley without molestation.

Just before daybreak on the fourth day we left our camp and continued our journey north-west, with provisions sufficient to last us six days, leaving the people of Iturn to ponder on the harsh fate they had drawn on themselves by their greed, treachery, and wanton murder and attack on peaceful strangers.

We were still a formidable force, strong in numbers, guns and property, though, for an expedition destined to explore so many thousands of miles of new countries, we had suffered severely. I had left the coast with over 300 men; but when I numbered the expedition at Mgongo Tembo, in Iramba, which we reached three days after departing from the scene of our war, I found that I had but 194 men left. Thus, in less than three months, I had lost, by dysentery, famine, heart disease, desertion and war, over 125 men, natives of Africa, and one European.

#### IRREPARABLE LOSSES.

I have not time — for my work is but beginning — to relate a tithe of our adventures, or how we suffered. You can better imagine our perils, our novel and strange fortunes, if you reflect on the loss of 126 men out of such an expedition. Such a loss even in a strong regiment would be deemed almost a calamity. What name will you give such a loss when you cannot recruit your numbers, where every man that dies is a loss that cannot be repaired; when your work, which is to last years, is but beginning; where, each morning, you say to yourself, "This day may be your last?"

On entering Iramba we found that the natives called out against all strangers, "Mirambo and his robbers are coming." But a vast amount of patience and suave language saved us from the doom that threatens this now famous chieftain. Despite, however, all medicines and magic arts that have been made and practiced as yet, Mirambo lives. He seems to make war upon all mankind in this portion of the African interior, and appears to be possessed of ubiquitous powers. We heard of him advancing upon the natives in northern Ugogo; Ukimbu was terror-stricken at his name; the people at Unyanyembe were still fighting him, and here in Iramba he has been met and fought, and is again expected.

As we journeyed on through Iramba and entered Usukuma his fame increased, for we were now drawing near some of the scenes of his exploits. When we approached the Victoria Nyanza he was actually fighting, but a day's march from us, with the people of Usanda and Masari, and a score of times we came near being plunged into wars because the natives mistook our expedition for Mirambo's force; but our color always saved us before we became actually engaged in conflict.

#### VARYING FORTUNES.

Various were our fortunes in our travels between Mgongo Tembo, in Iramba, and the Nyanza. We traversed the whole length of Usukuma, through the districts of Mombiti, Usiha, Mondo, Senge-remu and Marya, and passing through Usmaow, reentered Usukuma by Uchambi, and arrived at the lake, after a march of 720 miles.

#### TOPOGRAPHY.

As far as western Ogogo I may pass over without attempting to describe the country, as readers may obtain a detailed account of it from "How I Found Livingstone." Thence northward is a new country to all, and a brief description of it may be interesting to students of African geography.

North of Mizanza a level plain extends as far as the frontier of Usandawi, a distance of thirty-five miles (English.) At Mukondoku the altitude, as indicated by two first-rate aneroids, was 2,800 feet. At Mtiwi, twenty miles north, the altitude was 2,825 feet. Diverging west and north-west, we ascend the slope of a lengthy mountain wall, apparently, but which, upon arriving at the summit, we ascertain to be a wide plateau, covered with forest. This plateau has an altitude of 3,800 feet at its eastern extremity; but as it extends westward it rises to a height of 4,500 feet. It embraces all Uyanzi, Unyanyembe,

Usukuma, Urimi and Irambo ; in short, all that part of Central Africa lying between the valley of the Rufiji south and the Victoria Nyanza north, and the mean altitude of this broad upland cannot exceed 4,500 feet. From Mizanza to the Nyanza is a distance of nearly 300 geographical miles, yet at no part of this long journey did the aneroids indicate a higher altitude than 5,100 feet above the sea.

As far as Urimi, from the eastern edge of the plateau, the land is covered with a dense jungle of acacias, which tree, by its density, strangles all other vegetation. Here and there, only in the cleft of a rock, a giant euphorbia may be seen, sole lord of its sterile domain. The soil is shallow, and consists of vegetable mould mixed largely with sand and detritus of the bare rocks, which crown each knoll and ridge, and which testify too plainly to the violence of the periodical rains.

#### CURIOUS NATURAL RELICS.

In the basin of Matongo, in southern Urimi, we were instructed by the ruins of hills and ridges, relics of a loftier upland, of what has been effected by nature in the course of long ages. No learned geological savant need ever expound to the traveler who views these rocky ruins the geological history of this country. From a distance we viewed the glistening, naked and riven rocks as a singular scene ; but when we stood among them, and noted the appearance of the rocky fragments of granite, gneiss and porphyry, peeled, as it were, rind after rind, or leaf after leaf, like an artichoke, until the rock was wasted away, it seemed as if Dame Nature had left these relics, these hilly skeletons, to demonstrate her laws and career. It seemed to me as if she said, "Lo and behold this broad basin of Matongo, with its teeming village and herds of cattle and fields of corn, surrounded by these bare rocks — in primeval time this land was covered with water, it was the bed of a vast sea. The waters were dried, leaving a wide expanse of level land, upon which I caused heavy rains to fall five months out of each year during all the ages that have elapsed since first the hot sunshine fell upon the soil. The rains washed away the loose sand and made deep furrows in course of time, until, at certain places, the rocky kernel under the soil began to appear. The furrows became enlarged, the water frittered away their banks and conveyed the earth away to lower levels, through which it wore away a channel first through the soil and lastly through the rock itself, which you may see if you but walk to the bottom of that basin. You will there behold a channel, worn through the solid rock, some fifty feet in depth ; and as you look on that you will have an idea of the power and force

of tropical rains. It is through that channel that the soil, robbed from these rocks, has been carried away towards the Nyanza to fill its depths and in time make dry land of it. Now, you may ask how came these once solid rocks, which are now but skeletons of hills and stony heaps, to be thus split into so many fragments? Have you never seen the effect of water thrown upon lime? The solid rocks have been broken and peeled in an almost similar manner. The tropic sun heated the surface of these rocks to an intense heat, and the cold rain falling upon the heated surface caused them to split and peel as you now see them."

#### THE FEEDERS OF THE NIYANZA.

This is really the geological history of this country simply told. Ridge after ridge, basin after basin, from Western Ugogo to the Nyanza, tells the same tale; but it is not until we enter Central Urimi that we begin to marvel at the violence of the process by which nature has transformed the face of the land. For here the perennial springs and rivulets begin to unite and form rivers, after collecting and absorbing the moisture from the watershed; and these rivers, though but gentle streams during the dry season, become formidable during the rains. It is in Central Urimi that the Nile first begins to levy tribute upon Equatorial Africa, and if you look upon the map and draw a line east from the latitude of Ujiji to longitude thirty-five degrees you will strike upon the sources of the Leewumbu, which is the extreme southern feeder of the Victoria Nyanza.

In Iramba, between Mgongo Tembo and Mombiti we came upon what must have been in former times an arm of the Victoria Nyanzi. It is called the Lumamberri Plain, after a river of that name, and is about forty miles in width. Its altitude is 3,775 feet above the sea and but a few feet above the Victoria Nyanza. We were fortunate in crossing the broad, shallow stream in the dry season, for during the *mazika*, or rainy season, the plain is converted into a wide lake.

The Leewumbu river, after a course of 170 miles, becomes known in Usukuma as the Monangah river. After another run of 100 miles it is converted into Shimeeyu, under which name it enters the Victoria east of this port of Kagehyi. Roughly the Shimeeyu may be said to have a length of 350 miles.

#### USUKUMA ENTERED.

After penetrating the forest and jungle west of the Lumanberri we enter Usukuma — a country thickly peopled and rich in cattle.

It is a series of rolling plains, with here and there, far apart, a chain of jagged hills. The descent to the lake is so gradual that I expect to find upon sounding it, as I intend to do, that, though it covers a vast area, it is very shallow.

Now, after our long journey, the expedition is halted a hundred yards from the lake, and as I look upon its dancing waters I long to launch the *Lady Alice* and venture out to explore its mysteries. Though on its shore, I am as ignorant of its configuration and extent as any man in England or America. I have questioned the natives of Uchambi closely upon the subject at issue, but no one can tell me positively whether the lake is one or more. I hear a multitude of strange names, but whether they are of countries or lakes it is impossible to divine, their knowledge of it being very superficial. My impression, however, is that Speke, in his bold sketch and imagined outline, is nearer the truth than Livingstone, who reported of it upon hearsay at a great distance from its shores; but as soon as I can finish my letters to you and my friends the sections of the *Lady Alice* will be screwed together, and the first English boat that ever sailed on the African lakes shall venture upon her mission of thoroughly exploring every nook and cranny of the shores of the Victoria. It is with great pride and pleasure I think of our success in conveying such a large boat safely through the hundreds of miles of jungle which we traversed, and just now I feel as though the entire wealth of the universe could not bribe me to turn back from my work. Indeed, it is with the utmost impatience that I think of the task of writing my letters before starting upon the more pleasant work of exploring, but I remember the precept, "duty before pleasure."

#### STRANGE TALES.

I hear of strange tales about the countries on the shores of this lake, which make me still more eager to start. One man reports a country peopled with dwarfs, another with giants, and another is said to possess a breed of such large dogs that even my mastiffs are said to have been small compared to them. All these may be idle romance, and I lay no stress on any thing reported to me, as I hope to be enabled to see, with my own eyes, all the wonders of these unknown countries.

It is unfortunate that I have not Speke's book with me; but a map of Central Africa which I have with me, contains the statement, in brackets, that the Victoria Nyanza has an altitude of only 3,308 feet above the ocean. If this statement is on Speke's authority, either he

or I am wrong, for my two aneroids, almost fresh from England, make it much higher. One ranges from 3,550 to 3,650 feet; the other from 3,575 to 3,675 feet. I have not boiled my thermometers yet, but intend doing so before starting on the work of exploring the lake. I have no reason to suspect that the aneroids are at fault, as they are both first-class, and have been carefully carried with the chronometers.

With regard to Speke's position of Muanza, I incline to think that he is right, but as I have not visited Muanza I cannot tell. The natives point it out westward of Kagehyi and but a short distance off. The position of the port of Kagehyi is south latitude  $2^{\circ} 31'$ , east longitude  $33^{\circ} 13'$ .

#### MUSTERING THE EXPEDITION.

I mustered the men of the expedition yesterday and ascertained it to consist of three white men and 166 Wanguana soldiers and carriers, twenty-eight having died since leaving Ituru thirty days ago. Over one-half of our force has thus been lost by desertion and deaths. This is terrible, but I hope that their long rest here will revive the weak and strengthen the strong. The dreadful scourge of the expedition has been dysentery, and I can boast of but few men cured of it by medicine, though it was freely given, as we were possessed of abundance of medical stores. A great drawback to their cure has been the necessity of moving on, whereas a few days' rest, in a country blessed with good water and food, would have restored many of them to health; but good water and good food could not be procured anywhere together except here. The Arabs would have taken nine months or a year to march this long distance, while we have performed it in only 103 days, including halts. As I vaccinated every member of the expedition on the coast, I am happy to say that not one fell a victim to the small-pox.

#### • HOW THE LETTER WAS SENT.

I leave this letter in the hands of Sungoro, a Msawabili trader, who resides here, in the hope that he will be enabled shortly to send it to Unyanyembe, as he frequently sends caravans there with ivory; but a copy of it I shall take with me to Uganda, and deliver to Mtesa, the king, to be conveyed, if possible, to Colonel Gordon. Since leaving Mpwapwa I have not met one caravan bound for Zanzibar; and after leaving Ugogo it was impossible to meet one, or to dispatch couriers through such dangerous countries as we have traversed. The

letters containing the account of the explorations of the Victoria Nyanza and our subsequent march to the Albert Nyanza, I hope to be able to deliver personally into the hands of Colonel Gordon, and in this hope I remain, your's obediently.

HENRY M. STANLEY.

P. S. You may have observed that I have differed from Captain Speke in spelling Nyanza, as he calls it. I have taken the liberty of writing it as it is actually pronounced by both Arabs and natives, Ni-yanza or Neeyanza.

*March* 5. The boiling point observed by one of Negretti & Zambra's apparatus this day was  $205^{\circ} 6'$ ; temperature of air,  $82^{\circ}$  Fahrenheit. The boiling point observed by another instrument by a different maker, was  $205^{\circ} 5'$ ; temperature of air,  $81^{\circ}$  Fahrenheit. The barometer at the same time indicated 26.90 inches. The mean of the barometrical observations at Zanzibar was 30.048. The mean of the barometrical observations during seven days' residence here has been 26.138.

H. M. S.

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### STANLEY'S EIGHTH LETTER.

## DEATH OF POCKOCK.

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[From the New York Herald of October 11, 1875.]

KAGEHYI, ON THE VICTORIA NIYANZA, *March* 4, 1875.

DEAR SIR. — A most unpleasant, because sad, task devolves upon me, for I have the misfortune to have to report to you the death of your son Edward by typhoid fever. His service with me was brief, but it was long enough for me to know the greatness of your loss, for I doubt that few fathers can boast of such sons as yours. Both Frank and Ted proved themselves sterling men, noble and brave hearts and faithful servants. Ted had endeared himself to the members of the expedition by his amiable nature, his cheerfulness, and by various qualifications which brought him into high favor with the native soldiers of this force. Before daybreak we were accustomed

to hear the cheery notes of his bugle, which woke us to a fresh day's labors; at night, around the camp-fires, we were charmed with his sweet, simple songs, of which he had an inexhaustible *répertoire*. When tired also with marching it was his task to announce to the fatigued people the arrival of the vanguard at camp, so that he had become quite a treasure to us all; and I must say that I have never known men who could bear what your sons have borne on this expedition so patiently and uncomplainingly. I never heard one grumble either from Frank or Ted; have never heard them utter an illiberal remark, or express any wish that the expedition had never set foot in Africa, as many men would have done in their situation; so that you may well imagine that, if the loss of one of your sons causes grief to your paternal heart, it has been no less a grief to us, as we were all, as it were, one family, surrounded as we are by so much that is dark and forbidding.

#### THE STORY OF HIS DEATH.

On arriving at Suna, in Urini, Ted came to me, after a very long march, complaining of pain in his limbs and loins. I did not think it was serious at all, nor anything uncommon after walking twenty miles, but told him to go and lie down, that he would be better on the morrow, as it was very probably fatigue. The next morning I visited him and he again complained of pains in the knees and back, which I then ascribed to rheumatism and treated him accordingly. The third day he complained of pain in the chest, difficulty of breathing and sleeplessness, by which I perceived that he was suffering from some other malady than rheumatism, but what it could be I could not divine. He was a little feverish, so I gave him a mustard plaster and some aperient medicine. Toward night he began to wander in his head, and on examining his tongue I found it almost black, and coated with dark gray fur. At these symptoms I thought that he had a severe attack of remittent fever, from which I suffered in Ujiji in 1871, and, therefore, I watched for an opportunity to administer quinine—that is, when the fever would abate a little. But on the fourth day, the patient still wandering in his mind, I suggested to Frank, that he should sponge him with cold water, and change his clothing, during which operation I noticed that the chest of the patient was covered with spots like pimples or small-pox pustules, which perplexed me greatly. He could not have caught the small-pox, and what the disease was I could not imagine; but, turning to my medical books, I saw that your son was suffering from typhoid,



the description of which was too clear to be longer mistaken, and both Frank and I devoted our attention to him. He was nourished with arrowroot and brandy, and everything that was in our power to do was done, but it was very evident that the case was serious, though I hoped that his constitution would brave it out.

On the fifth day we were compelled to resume our journey, after a rest of four days. Ted was put in a hammock and carried on the shoulders of four men. At ten o'clock on the seventeenth of January we halted at Chiwyn, and the minute that he was laid down in the camp he breathed his last. Our companion was dead.

#### THE BODY LAID TO REST.

We buried him that night under a tree, on which his brother Frank had cut a deep cross, and read the beautiful service of the Church of England over him as we laid the poor worn-out body in its final resting place.

Peace be to his ashes! Poor Ted deserved a better fate than dying in Africa, but it was impossible that he could have died easier. I wish that my end may be as peaceful and painless as his. He was saved the stormy scenes we went through shortly after in our war with the Waturu; and who knows how much he has been saved from? But I know that he would have rejoiced to be with us at this hour of our triumph, gazing on the laughing waters of the vast fountain of old Nile. None of us would have been more elated at the prospect before us than he, for he was a true sailor and loved the sight of water. Yet again I say, peace be to his ashes; be consoled, for Frank still lives, and from present appearance is likely to come home to you with honor and glory such as he and you may well be proud of. Believe me, dear sir, with true sincerity, your well wisher.

HENRY M. STANLEY.

## STANLEY'S NINTH LETTER.

## DEATH OF BARKER.

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[From the New York Herald of October 11, 1875.]

VILLAGE OF KAGEHYI, DISTRICT OF UCHANBI,  
USUKIMA, CENTRAL AFRICA, *May 15, 1875.* }

MRS. CHARLOTTE BARKER. — Dear Mrs. Barker, I grieve to have to write to you on such a sad topic as this letter must contain. I would that some one else had undertaken the task or that Francis Pocock, your son's companion, had fulfilled, before his departure from here, what I had expressly ordered him to do.

But that I wish to save you from a too sudden blow I would have delayed writing until Pocock had written his report to me of the manner how or when of your poor son's last hours, for you must know that your son, Frederick Barker, is gone to his eternal rest.

I was absent on the exploring expedition of Lake Victoria, having left Francis Pocock and Frederick Barker in charge of my camp. Altogether I was absent fifty-eight days. When I returned, hoping that I would find that all had gone well, I was struck with the grievous news that your son had died twelve days before of an intermittent fever.

## HOW BARKER DIED.

What little I have been able to learn of your son's death amounts to this: On April twenty-two he went out to the lake with Pocock to shoot hippopotami, and all day enjoyed himself. On the morning of the twenty-third he went out for a little walk, had his tea and some pancakes, washed himself, and then suddenly said he felt ill and lay down in bed. He called for a hot stone to be applied to his feet; brandy was given him, blankets were heaped on him; but he felt such cold in his extremities that nothing availed to restore the heat in his body. His blood seems to have become congealed. At eight A. M., an hour after he lay down, he was dead. Such is what I have been able to glean from Pocock of the manner of his death, but by our next letter-carrier Pocock shall send on a complete account.

His clothes and effects shall be sold at auction in this camp, and

whatever they produce, with such money as may be due to him for wages, shall be rendered to you. His papers, photos and Testament I shall keep until I have an opportunity to send them to you.

#### BARKER'S GOOD QUALITIES.

Dear Mrs. Barker, you may believe me as you may, but in Fred Barker I have lost one of as much value to me as he was dear to you. He was such a clever, quick, intelligent servant that had he lived to reach home, and I had lived to see him there, his future need never have been a source of anxiety to him. Indeed, there is no doubt he before long would have ranked high in the estimation of worthy men, and become a most useful member of intelligent society. Gentleness, honesty and politeness were his special characteristics. I had such confidence in him that I had placed him in charge of all my stores, and during my absence on the lake, appointed him half share in the command of 166 soldiers.

From the coast to this lake, a distance of 720 miles, he trudged it afoot like a hero. When sick, of course he rode one of our animals. Whatever I told him became so impressed on his memory that I need never repeat the order or complain of its neglect. Whatever I advised him to do became with him a law, whatever I suggested to him immediately was obeyed, as though it were a command. He was a rare young man, mettlesome, manly, and thoroughly English in his good qualities. It is then to be grieved that you have lost such a hopeful son, I such a true servant, and his country such a promising character. I sympathize with you deeply — not I alone; we all of us in this camp, for we have lost one such that his place cannot be filled.

God's comfort be with you in this distress, and believe me yours faithfully.

HENRY M. STANLEY.

*Commanding the Anglo-American Expedition.*

## STANLEY'S TENTH LETTER.

## SURVEYING THE EASTERN SHORE OF THE VICTORIA NIYANZA.

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[From the New York Herald of November 29, 1875.]

ULAGALLA, MTESA'S CAPITAL, UGANDA, }  
 E. LON. 32° 49' 45", N. LAT. 0° 32', April 12, 1875. }

I write this letter in a hurry, as it is the mere record of a work begun and not ended—I mean the exploration of the Victoria Nyanza. But brief as it necessarily must be, I am sure it will interest thousands of your readers, for it solves the great question, “Is the Victoria Nyanza one lake, or does it consist of a group of lakes such as Livingstone reported it to be?” In answer to the query, I will begin by stating that I have explored, by means of the *Lady Alice*, the whole of the southern, eastern and north-eastern shores of the Victoria Nyanza, have penetrated into every bay, inlet and creek that indents its shores, and have taken thirty-seven observations, so that I feel competent to decide upon the question at issue, without bias or prejudice to any hypothesis. I have a mass of notes relating to the countries I visited, and ample means of making a proper chart at my camp at Usukuma, but I have neither paper, parallel rules nor any instrument whatever to lay down the positions I have taken, with me at present. I merely took an artificial horizon, sextant, chronometer, two aneroids, boiling-point apparatus, sounding-line, a few guns, ammunition and some provisions, as I wished to make the boat as light as possible, that she might work easily in the storms of the Nyanza. But when I reach camp I propose to draw a correct chart of the Nyanza and write such notes upon the several countries I have visited as will amply repay perusal and study.

## AMERICAN SURVEY OF THE LAKE.

I have already informed you that our camp at Kagehyi, in Usukuma, is situated in longitude 33° 13' east and latitude 2° 31' south. Before starting on the exploration of the lake I ascertained that Muanza was situated a few miles west, almost on the same parallel of latitude as Kagehyi. Now Muanza is the point whence Speke observed the Victoria Nyanza, and where he drew his imaginary sketch of the

lake from information given to him by the natives. If you will look at Speke's map you will find that it contains two islands — Ukerewe and Maziti. Looking at the same objects from Kagehyi, I would have concluded that they were islands myself; but a faithful exploration of the lake has proved that they are not islands, but a lengthy promontory of land extending from longitude  $34^{\circ} 45\frac{1}{2}'$  east, to longitude  $32^{\circ} 40' 15''$  east. That part of the lake that Speke observed from Muanza is merely a huge gulf, about twenty-five miles wide by sixty-five miles long. To the noble Lake Nyanza, Speke loyally added that of Victoria, as a tribute to his sovereign, which let no man take away; but in order to connect forever Speke's name to the lake which he discovered I have thought it but simple justice to the gallant explorer to call this immense gulf Speke Gulf. If you look again on Speke's map you will observe how boldly he has sketched the Nyanza stretching eastward and north-eastward. Considering that he drew it from mere native report, which never yet was exact or clear, I must say that I do not think any other man could have arrived so near the truth. I must confess that I could not have done it myself, for I could make nothing of the vague and mythical reports of the natives of Kagehyi.

#### AT THE MOUTH OF THE SHIMEEYU.

Proceeding eastward to the unknown and fabulous distance in the Lady Alice, with a picked crew of eleven men and a guide, I coasted along the southern coast of the lake, round many a noble bay, until we came to the mouth of the Shimeeyu, in longitude  $33^{\circ} 33'$  east, latitude  $2^{\circ} 35'$  south — by far the noblest river that empties into the lake that we have yet seen. The Shimeeyu has a length of 370 miles, and is the extreme southern source of the Nile. Before emptying into the lake it unites with the Luamberri river, whence it issues in a majestic flood to Lake Victoria Nyanza. At its mouth it is a mile wide, but contracts as we proceed up the river to 400 yards. Even by itself it would make no insignificant White Nile. By accident our route through Itaru took us from its birthplace, a month's march from the lake, and along many a mile of its crooked course, until by means of the Lady Alice we were enabled to see it enter the Nyanza, a river of considerable magnitude.

#### SIMA AND MAGU.

Between the mouth of the Shimeeyu and Kagehyi were two countries — Sima and Magu — of the same nature as Usukuma, and

inhabited by peoples speaking the same dialect. On the eastern side of the river is Mazanza, and beyond Manasa.

#### SOUTHWARD TO UTUTWA.

Coasting still along the southern shore of the lake, beyond Manasa, we come to Ututwa, inhabited by a people speaking a different language, namely, that of the Wajika, as the Wamasai are called here, a people slender and tall, carrying formidably long knives and terrible and portentous spears.

#### THE EXTREME END OF SPEKE GULF.

In longitude  $33^{\circ} 45' 45''$  east, we came to the extreme end of Speke gulf, and then turned northward as far as latitude  $2^{\circ} 5'$  south, whence we proceeded westward almost in a straight line along Shashi and Iranbu, in Ukerewe. In longitude  $33^{\circ} 26'$  east, we came to a strait — the Rugeji strait — which separates one-half of Ukerewe from the other half, and by which there is a direct means of communication from Speke gulf with the countries lying north of Ukerewe. We did not pass through, but proceeded still westward, hugging the bold shores of that part of Ukerewe which is an island, as far as longitude  $32^{\circ} 40' 15''$  east, whence, following the land, we turned north-west, thence north, until in latitude  $1^{\circ} 53'$  south, we turned east again, coasting along the northern shores of Ukerewe island until we came to the tabular-topped bluff of Majita (Speke miscalled this Mazita or Maziti, and termed it an island), in longitude  $33^{\circ} 9' 45''$  east, and latitude  $1^{\circ} 50'$  south, whence the land begins to trend northward of east. North of Kashizu, in Ukerewe, lies the large island of Ukura, which gives its name with some natives to that part of the lake lying between it and Ukerewe. It is about eighteen miles long by twelve wide, and is inhabited by a people strong in charms and magic medicine. From Majita we pass on again to the north shore of Shashi, whose south coast is bounded by Speke gulf, and beyond Shashi we come to the first district in Ururi.

#### IN URURI.

Ururi extends from Shashi, in latitude  $1^{\circ} 50'$  south, to latitude  $0^{\circ} 40'$  south, and embraces the districts of Wye, Irieni, Urieri, Igengi, Kutiri, Shirati and Mohuru. Its coast is indented most remarkably with bays and creeks, which extend far inland. East of the immediate coast-line the country is a level plain, which is drained by an important

river called Shirati. All other streams which issue into the lake along the coast of Ururi are insignificant.

North of Shirati, the most northern district of Ururi, begins the country of Ugeyeya, whose bold and mountainous shores form a strong contrast to the flats of Shirati and Moluru. Here are mountains rising abruptly from the lake to a height of 3,000 feet and more. This coast is also very crooked and irregular, requiring patient and laborious rowing to investigate its many bends and curves. The people are a timid and suspicious race, much vexed by their neighbors, the Waruri, south, and Wamasui, east, and are loath to talk to strangers, as the Arab slave dealers of Pangani have not taught them to love people carrying guns.

The Wageyeya, having been troubled by the Waruri, have left many miles of wilderness between their country and that of their fierce neighbors uninhabited. But Sungoro, the agent of Mse Saba, who prompted the Waruri to many a devilish act, and has purchased the human spoils, is constructing in Ukerewe a dhow of twenty or thirty tons burden, with which he intends to prosecute more actively his nefarious trade. Nothing would have pleased me better than to have been commissioned by some government to hang all such wretches wherever found; and if ever a pirate deserved death for inhuman crimes, Sungoro, the slave trader, deserves death. Kagehyi, Usukuma, has become the seat of the inhuman trade in slaves. To this point they are collected from Sima, Magu, Ukerewe, Ururi and Ugeyeya; and when Sungoro has floated his dhow and hoisted his blood-stained ensign, the great sin will increase ten-fold, and the caravan road to Unyanyembe will become hell's highway.

On the coast of Ugeyeya I expected to discover a channel to another lake, as there might be a grain of truth in what the Wanguana reported to Livingstone; but I found nothing of the sort, except unusually deep bends in the shore, which led nowhere. The streams were insignificant and undeserving the name of rivers.

#### ISLANDS AT THE EQUATOR.

A few miles from the equator I discovered two islands formed of basaltic rock and overgrown with a dense growth of tropical vegetation. One had a natural bridge of rock thirty feet long and fifteen feet wide; the other had a small cave.

In longitude 34° 49' east, at Nakidimo, Ugeyeya, we came to the furthest point east of the Victoria Nyanza.

## BARINGO.

North of Ugeyeya begins Baringo, a small country, extending over about fifteen miles of latitude. Its coast is also remarkable for deep indentations and noble bays, some of which are almost entirely closed by land and might well be called lakes by the uncultivated Wangwana. Large islands are also numerous, some of which lie so close to the mainland that if we had not hugged its shore closely we should have mistaken them for portions of the mainland. North of Baringo the land is again distinguished by lofty hills, cones and plateaus, which sink eastward into plains, and here a new country commences — Unyara, the language of whose people is totally distinct from that of Usukuma, and approaches to that of Uganda and Usoga.

## THE POPULATION.

Unyara occupies the north-eastern coast of the Victoria Nyanza, and by observation the extreme north-eastern point of the Nyanza ends in longitude  $34^{\circ} 35'$  east and latitude  $33^{\circ} 43'$  north. As I intend to send you a chart of the Nyanza, it is needless here to enter into minor details, but I may as well mention now that a large portion of the north-eastern end of the lake is almost entirely closed in by the shores of Ugana and of two islands, Chaga and Usugura, the latter of which is one of the largest in the Nyanza.

## THE GEOGRAPHICAL SITUATION.

While Unyara occupies the north-eastern coast of the Nyanza, Ugana begins the northern coast of the lake from the east, which, running south-west a few miles, forms here a large bay. It then trends westward, and the island of Chaga runs directly north and south for eight miles at a distance of twelve miles from the opposite coast of Unyara. With but a narrow channel between, Usuguru island runs from the southern extremity of Chaga, in a south-south-easterly direction, to within six miles from the eastern shore of the mainland. Thus almost a lake separate from the Nyanza is formed.

North of Chaga island, Usoga begins with the large district of Usowa, where we met with the first hostile intention — though not act, as the act was checked by show of superior weapons — on the part of the natives. Thence, as we proceed westward, the districts of Ugamba, Uvira, Usamu and Utamba line the coast of Usoga.

Where Utamba begins, large islands again become frequent, the principal of which is Uvuma, an independent country and the largest in the Victoria Nyanza.



## FIRST ATTACK BY NATIVES.

At Uvuma we experienced treachery and hostility on the part of the natives. By show of friendship on their part we were induced to sail within a few yards of the shore, while a mass of natives were hid in ambush behind the trees. While sailing quietly by, exchanging friendly greetings with them, we were suddenly attacked with a shower of large rocks, several of which struck the boat; but the helm being quickly put "hard up," we sheered from shore to a safer distance, yet not before one of the rascals was laid dead by a shot from one of my revolvers.

After proceeding some miles we entered a channel between the islands of Uvuma and Bugeyeya, but close to the shore of Uvuma. Here we discovered a fleet of large canoes — thirteen in number — carrying over a hundred warriors, armed with shields and spears and slings. The foremost canoe contained baskets of sweet potatoes, which the people held up as if they were desirous to trade. I ordered my people to cease rowing, and as there was a slight breeze we still held on with the sail and permitted the canoe to approach.

## SECOND ATTACK.

While we were bargaining for potatoes with this canoe the other canoes came up and blocked the boat, while the people began to lay hands on everything; but we found their purpose out, and I warned the canoes away with my gun. They jeered at this and immediately seized their spears and shields, while one canoe hastened away with some beads they had stolen, and which a man insolently held up to my view, and invited us to catch him. At sight of this I fired, and the man fell dead in his canoe. The others prepared to launch their spears, but the repeating rifle was too much for the crowd of warriors who had hastened like pirates to rob us. Three were shot dead, and as they retreated my elephant rifle smashed their canoes, the result of which we saw in the confusion attending each shot. After a few shots from the big gun we continued on our way, still hugging the shore of Uvuma, for it was unnecessary to fly after such an exhibition of inglorious conduct on the part of thirteen canoes, containing in the aggregate over 100 men.

In the evening we anchored in the channel between Uvuma and Usoga, in east longitude  $33^{\circ} 40' 15''$ , and north latitude  $0^{\circ} 30' 9''$ .

## NAPOLEON CHANNEL — THE CURRENT.

Next morning, the current perceptibly growing stronger as we advanced north, we entered the Napoleon channel that separates Usoga from Uganda, and then sailed across to the Uganda shore. Having arrived close to the land, we pulled down sail and rowed towards the Ripon falls, the noise of whose rushing waters sounded loud and clear in our ears. The lake shoaled rapidly, and we halted to survey the scene at a spot half a mile from the first mass of foam caused by the escaping waters. Speke has been most accurate in his description of the outflowing river, and his pencil has done fair justice to it. The scenery around, on the Usoga and the Uganda side, has nothing of the sublime about it, but it is picturesque and well worthy a visit. A few small islands dot the channel and lie close ashore; while at the entrance of the main channel, looking south, the large islands of Uziri and Wanzi stretch obliquely, or south-west, toward Uvuma. But the eye of the observer is more fascinated by the ranks of swelling foam and leaping waters than by the uneven contour of the land. The ear is attracted by the rough music of their play, despite the terrors which the imagination paints to us, and it absorbs all our attention to watch the smooth, flowing surface of the lake, suddenly broken by the rocks of white gneiss and ruddy hematite which protrude above the water, and which threaten instant doom to the unlucky navigator who might be drifted among them. There is a charm in the scene that belongs to few such, for this outflowing river, which the great Victoria Nyanza discharges from its bosom, becomes known to the world as the White Nile. Though born amid the mountains of Itura, Kargue and Ugeyeya, it emerges from the womb of the Nyanza the perfect Nile which annually resuscitates parched Egypt.

From the Ripon falls we proceeded along the coast of Ikira south-westward until, gaining the shore opposite Uziri, we coasted westerly along the irregular shore of Uganda.

## GUIDES OBTAINED.

Arriving at the isle of Kriva we secured guides, who voluntarily offered to conduct us as far as Mtesa's capital.

## A MESSAGE TO KING MTESA.

Halting a short time at the island of Kibibi, we proceeded to Ukafu, where a snug horse-shoe-shaped bay was discovered. From Ukafu we despatched messengers to Mtesa to announce the arrival of

a white visitor in Uganda, after being most hospitably received with fair words but with empty hands along the coast of Uganda.

#### CORRECTION OF THE MAPS.

I was anxious to discover the entrance of the Luajerri, and questioned the natives long and frequently about it, until, securing an interpreter who understood the Kisawahili, we ascertained that there was no such river as the Luajerri; that *luaserri* meant "still water," applicable to any of the many lengthy creeks or narrow inlets which indent the coasts of Uganda and Usoga, from which I conclude that Speke was misinformed, and that his "Luajerri" is *luaserri* or still water. At least, we discovered no such river, either sluggish or quick, flowing northwards; while in the neighborhood of "Murchison Creek," I did discover a long and crooked inlet called Mwrau — a *luaserri*, or still water — which penetrated several miles inland, the termination of which we saw. I noticed a positive tide here during the morning. For two hours the water of this creek flowed north, subsequently for two hours it flowed south, and on asking the people if it were usual they said it was, and was visible in all of the inlets on the coast of Uganda.

#### ROYAL NAVAL WELCOME.

Arriving at Beya, we were welcomed by a fleet of canoes sent by Mtesa to conduct us to Murchison creek.

On the fourth of April I landed amid a concourse of 2,000 people, who saluted me with a deafening volley of musketry and waving of flags. Katakiri, the chief mukungu, or officer in Uganda, then conducted me to comfortable quarters, to which shortly afterward were brought sixteen goats, ten oxen, an immense quantity of bananas, plantains, sweet potatoes, besides eggs, chickens, milk, rice, ghee and butter. After such a royal and bountiful gift I felt more curiosity than ever to see the generous monarch.

#### MTESA'S RECEPTION.

In the afternoon Mtesa, having prepared beforehand for my reception, sent to say that he was ready to receive me. Issuing out of my quarters I found myself in a broad street eighty feet wide and half a mile long, which was lined by his personal guards and attendants, his captains and their respective retinues, to the number of about 3,000. At the extreme end of this street and fronting it was the king's audience house, in whose shadow I saw dimly the figure of the king sitting in a chair.

As I advanced toward him the soldiers continued to fire their guns. The drums, sixteen in number, beat a fearful tempest of sound, and the flags waved, until I became conscious that all this display was far beyond my merits, and, consequently, felt greatly embarrassed by so flattering a reception. Arrived before the audience house the king rose — a tall and slender figure, dressed in Arab costume — approached me a few paces, held out his hand mutely, while the drums continued their terrible noise, and we stood silently gazing at each other a few minutes, I, indeed, more embarrassed than ever. But soon, relieved from the oppressive noise of the huge drums and violence of the many screaming, discordant fifes, I was invited to sit, Mtesa first showing the example, followed by his great captains, about 100 in number.

#### HIS PERSONAL APPEARANCE.

More at ease, I surveyed the figure and features of this powerful monarch. Mtesa is about thirty-four years old, and tall and slender in build, as I have already stated, but with broad shoulders. His face is very agreeable and pleasant, and indicates intelligence and mildness. His eyes are large, his nose and mouth are a great improvement upon those of the common type of negro, and approach to that of the Muscat Arab, slightly tainted with negro blood. His teeth are splendid, and gleaming white.

#### MANNER OF ADDRESS.

As soon as Mtesa began to speak I became captivated by his manner, for there was much of the polish of a true gentleman about it — it was at once amiable, graceful and friendly. It assured me that in Mtesa I had found a friend, a generous king, and an intelligent ruler. He is infinitely superior to Seyd Burghash, the Arab sultan of Zanzibar, and he appears to me like a colored gentleman who has visited European courts, whence he has caught a certain polish and ease of manner and a vast amount of information which he has collected for the improvement of his race. If you will recollect that Mtesa is a native of Central Africa, and that he had seen but three white men until I came, you will, perhaps, be as much astonished at this as I was. And if you will but think of the enormous extent of country he rules, extending from east longitude 34 to east longitude 31, and from north latitude 1 to south latitude 3° 30,' you will perceive the immense influence he could wield toward civilization in Africa. Indeed I could not regard this king or look at him in any

other light than the Augustus by whose means the light of the Gospel will be brought to benighted Middle Africa.

Undoubtedly the Mtesa of to-day is vastly superior to the vain youth whom Speke and Grant saw. There is no butchery of men or women; seldom one suffers the extreme punishment. Speke and Grant left him a raw, vain youth, and a heathen. He is now a gentleman, and, professing Islamism, submits to other laws than his own erratic will, which, we are told, had led him to severe and fatal consequences. All his captains and chief officers profess the same creed, dress in Arab costume and in other ways affect Arab custom. He has a guard of 200 men — renegadoes from Baker's expedition, Zanzibar defaulters, a few Omani and the elect of Uganda.

#### HIS COURT.

Behind his throne, an armchair of native manufacture, the royal shield bearers, lance bearers and gun bearers stand erect and staid. On either side of him are his grand chiefs and courtiers, sons of governors of his provinces, chiefs of districts, etc. Outside the audience house the lengthy lines of warriors begin with the chief drummer and the noisy goma-beaters. Next come the screaming fifers, the flag and banner bearers, the fusiliers, and so on with spearmen, seemingly *ad infinitum*.

#### GAYETY AND REJOICING.

Mtesa asked a number of questions about various things, thereby showing a vast amount of curiosity and great intelligence.

The king had arrived at this camp — Usavara — fourteen days before my arrival, with this immense army of followers, for the purpose of shooting birds. He now proposed to return, after two or three days' rest, to his capital at Ulagalla, or Uragara. Each day of my stay at Usavara was a scene of gayety and rejoicing. On the first after my arrival we beheld a grand naval review — eighty-four canoes, each manned by from thirty to forty men, containing in the aggregate a force of about 2,500. We had excellent races and witnessed various manœuvres by water. Each admiral vied with the other in extolling aloud the glory of their monarch, or in exciting admiration from the hundreds of spectators on shore. The king's 300 wives were present *en grande tenue*, and were not the least important of those on shore.

## OUTDOOR SPORT.

The second day the king led his fleet in person to show me his prowess in shooting birds. We rowed, or were rather paddled, up "Murchison creek," visiting *en route* a dhow he is building for the navigation of the lake, his place of residence, and his former capital, Banda, where Speke and Grant found him.

## HINTS FOR THE GEOGRAPHERS.

*En passant*, I may remark that Speke could not possibly have seen the whole of the immense bay he has denominated "creek." It is true that from a short distance west of Dwaga, his Ramazan palace, up to Mngono, the extremity of the bay, a distance of about eight miles, it might be termed a creek, but this distance does not approach to one-half of the bay. I respectfully request geographers, Messrs. Keith, Johnston and Stanford especially, to change the name of Murchison creek to Murchison bay, as more worthy the large area of water now known by the former inappreciative title. Murchison bay extends from north latitude  $15^{\circ}$  to north latitude  $27^{\circ}$ , and from east longitude  $32^{\circ} 53'$  to  $32^{\circ} 38'$  in extreme length. At the mouth the bay contracts to a width of four miles, but within its greatest breadth is twelve miles. Surely such a body of water—as terms go—deserves the more appropriate name of bay, but I leave it to fair judging geographers to decide. For the position of Mtesa's capital I have taken three observations, three different days. My longitude agrees pretty closely with that of Speke's, while there is but four miles difference in latitude.

## THE ARMY.

The third day the troops of Mtesa were exercised at target practice, and on the fourth day we all marched for the grand capital, the Kibuga of Uganda, Ulagalla or Uragara.

## MTESA IS A GREAT KING.

He is a monarch who would delight the soul of any intelligent European, as he would see in Mtesa the hope of Central Africa. He is king of Karagwe, Uganda, Unyoro, Usoga and Usui. Each day I saw something which increased my esteem and respect for him. He is fond of imitating Europeans and great kings, which trait, with a little tuition, would be of immense benefit to his country. He has prepared broad highways in the neighborhood of his capital for the good time that is coming when some charitable European will send

him any kind of a wheeled vehicle. As we approached the capital the highway from Usavara increased in width from twenty feet to 150 feet. When we arrived at this magnificent breadth we viewed the capital crowning an eminence commanding a most extensive view of a picturesque and rich country teeming with gardens of plantains and bananas, and beautiful pasture land. Of course huts, however large, lend but little attraction to a scene, but a tall flag-staff and an immense flag proved a feature in the landscape.

#### IN THE CAPITAL.

Arrived at the capital I found that the vast collection of huts crowning the eminence were the royal quarters, around which ran five several palisades and circular courts, between which and the city was a circular road, ranging from 100 to 200 feet in width, from which radiated six or seven magnificent avenues, lined with gardens and huts.

#### AT THE PALACE IN STATE.

The next day after arrival I was introduced to the royal palace in great state. None of the primitive scenes visible in Speke's book were visible here. The guards, clothed in white cotton dresses, were by no means comical. The chiefs were very respectable looking people, dressed richly in the Arab costume. The palace was a huge and lofty structure, well built of grass and cane, while tall trunks of trees upheld the roof, which was covered with cloth sheeting inside.

#### THE EGYPTIAN ENVOY.

On the fourth day after my arrival news came that another white man was approaching the capital from the direction of Unyoro, and on the fifth day I had the extreme pleasure of greeting Colonel Linant de Bellefonds, of the Egyptian service, who had been despatched by Colonel Gordon to Mtesa, to make a treaty of commerce between him and the Egyptian government. The meeting, though not so exciting as my former meeting with the venerable David Livingstone, at Ujiji, in November, 1871, still may be said to be singular and fortunate for all concerned. In Colonel Bellefonds I met a gentleman extremely well informed, energetic and a great traveler. His knowledge of the countries between Uganda and Khartoum was most minute and accurate, from which I conclude that but little of the geography of Central Africa between the cataracts of the Nile and Uganda is unknown. To which store of valuable geographical acquisitions must now be added my exploration of the Nile sources,

which pour into the Nyanza and the new countries I have visited between the Nyanza and the Unyanyembe road. In Colonel Bellefonds I also perceived great good fortune, for I now had the means to despatch my reports of geographical discoveries and my long delayed letters.

#### THE FUTURE.

The day after to-morrow I intend to return to Usukuma, prosecuting my geographical researches along the western shore of the Victoria Nyanza. After which I propose to march the expedition to the Katonga valley, and thence, after another visit to Mtesa, march directly west for Lake Albert Nyanza, where I hope to meet with some more of the gallant subordinates of Colonel Gordon, by whom I shall be able, through their courtesy, to send several more letters descriptive of discoveries and adventures.

I might protract this letter indefinitely by dwelling upon the value of the service rendered to science and the world by Ismael Pacha, but time will not allow me, nor, indeed, is it necessary, as I dare say by this time you have had ample proofs of what has been done by Gordon. Baker, unfortunately, appears to be in bad odor with all I meet. His severity and other acts receive universal condemnation; but far be it from me to add to the ill report, and so I leave what I have heard untold.

#### SPEKE RIGHT — LIVINGSTONE WRONG.

Then, briefly, thus much remains to be said. Livingstone, in his report of the Nyanza consisting of five lakes, was wrong. Speke, in his statement that the Nyanza was but one lake, was quite correct. But I believe that east of the Nyanza, or rather north-east of the Nyanza, there are other lakes, though they have no connection whatever with the Nyanza; nor do I suppose they are of any great magnitude or extend south of the Equator. If you ask me why, I can only answer that in my opinion the rivers entering the Nyanza on the north-eastern shore do not sufficiently drain the vast area of country lying between the Nyanza and the western versant of the Eastern African mountain range. From the volume of the Nyanza-feeders on the north-eastern side I cannot think that they extend further than longitude  $36^{\circ}$  east, which leaves a large tract of country east to be drained by other means than the Nyanza. But this means may very probably be the Inb, which empties its waters into the Indian ocean. The Sobat cannot possibly approach near the Equator. This, however, will be decided definitively by Gordon's officers.



Colonel Bellefonds informs me that the Assua, or Asha, is a mere torrent.

When you see my chart, which will trace the course of the Luamberri and the Shimeeyu, rivers which drain all of the southern and south-eastern countries of the Nyanza, you will be better able to judge of their importance and magnitude as sources of the Nile. I expect to discover a considerable river south-west; but all of this will be best told in my next letter.

HENRY M. STANLEY.

P. S. — I had almost forgotten to state that the greatest depth of the Nyanza as yet ascertained by me is 275 feet. I have not yet sounded the center of the lake; this I intend to do on my return to Usukuma south.

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### STANLEY'S ELEVENTH LETTER.

### KING M'TSE AND HIS COUNTRY.

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[From the New York Herald of November 29, 1875.]

#### RELIGION AT COURT — TRIUMPH OF CHRISTIANITY.

M'TSE'S CAPITAL, UGANDA, *April 14, 1875.*

I had almost neglected to inform you and your readers of one very interesting subject connected with M'tsé which will gratify many a philanthropic European and American.

I have already told you that M'tsé and the whole of his court profess Islamism. A long time ago, some four or five years, Khamis bin Abdullah (the only Arab who remained with me three years ago, as a rearguard, when the Arabs disgracefully fled from Mirambo) came to Uganda. He was wealthy, of noble descent, had a magnificent personal appearance, and brought with him many a rich present, such as few Arabs could afford, for Mtesa. The king became immediately fascinated with him, and really few white men could be long with the son of Abdullah without being charmed by his presence, his handsome, proud features, his rich olive complexion and his liberality. I confess I never saw an Arab or Mussulman who attracted me so much as Khamis bin Abdullah, and it is no wonder that M'tsé,

meeting a kindred spirit in the noble Arab of Muscat, amazed at the magnificent figure, the splendor of his apparel, the display of his wealth and the number of his slaves fell in love with him. Khamis stayed with M'tsé a full year, during which time the king became a convert to the creed of Khamis — namely, Mohammedanism. The Arab clothed Mtesa in the best that his wardrobe offered. He gave him gold-embroidered jackets, fine white shirts, crimson slippers, swords, silk sashes, daggers and a revolving rifle, so that Speke's and Grant's presents seemed quite insignificant.

Until I arrived at M'tsé's court the king delighted in the idea that he was a follower of Islam; but by one conversation I flatter myself that I have tumbled the newly-raised religious fabric to the ground, and, if it were only followed by the arrival of a Christian mission here, the conversion of M'tsé and his court to Christianity would be complete. I have undermined Islamism so much here that M'tsé has determined henceforth, until he is better informed, to observe the Christian Sabbath as well as the Moslem Sabbath, and the great captains have unanimously consented to it. He has caused the ten commandments of Moses to be written on a board for his daily perusal (as M'tsé can read Arabic), as well as the Lord's prayer and the golden commandment of our Saviour, "Thou shalt love thy neighbor as thyself." This is great progress for the few days that I have remained with him, and, though I am no missionary, I shall begin to think that I shall become one if success is so feasible.

#### THE GRAND FIELD FOR CHRISTIAN MISSIONARIES.

But, oh, that some pious, practical missionary would come here! What a field and a harvest ripe for the sickle of the Gospel! M'tsé would give him any thing he desired — houses, lands, cattle, ivory, etc. He might call a province his own in one day. It is not the mere preacher that is wanted here. The bishops of all Great Britain collected, with all the classic youth of Oxford and Cambridge, would effect nothing here with the intelligent people of Uganda. It is the practical Christian tutor, who can teach people how to become Christians, cure their diseases, construct dwellings, understands agriculture and can turn his hand to any thing, like a sailor — this is the man that is wanted here. Such a man, if he can be found, would become the saviour of Africa. He must be tied to no church or sect, but profess God and His Son, and live a blameless Christian, be inspired by liberal principles, charity to all men and devout faith in God. He must belong to no nation in particular, but the entire white race.

Such a man or men M'tsé, King of Uganda, Usoga, Unyoro and Karagwe — a kingdom 360 geographical miles in length by fifty in breadth — invites to come to him. He has begged me to tell the white men that if they will only come to him he will give them all they want.

Now where is there in all the pagan world a more promising field for a mission than Uganda? Colonel Linaut de Bellefonds is my witness that I speak the truth, and I know he will corroborate all I say. The colonel, though a Frenchman, is a Calvinist, and has become as ardent a well-wisher for the Waganda as I am.

Then why further spend needlessly vast sums upon black pagans of Africa who have no example of their own people becoming Christians before them? I speak to the Universities Mission at Zanzibar and to the Free Methodists at Mombassa, to the leading philanthropists and the pious people of England. Here, gentlemen, is your opportunity — embrace it! The people on the shores of the Nyanza call upon you. Obey your own generous instincts, and listen to them, and I assure you that in one year you will have more converts to Christianity than all other missionaries united can number. The population of M'tsé's kingdom is most dense. I estimate the number of his subjects at 2,000,000. You need not fear to spend money upon such a mission, as M'tsé is sole ruler, and will repay its cost ten-fold with ivory, coffee, otter skins of a very fine quality, or in cattle, for the wealth of this country in all these products is immense.

The road here is by the Nile, or via Zanzibar, Ugogo and Unyanyembe. The former route, so long as Colonel Gordon governs the countries of the Upper Nile, is the most feasible.

With permission I would suggest that the mission should bring to M'tsé as presents three or four suits of military clothes, decorated freely with gold embroidery, with half a dozen French *kepis*, a sabre, a brace of pistols and suitable ammunition; a good fowling piece and rifle of good quality, as the king is not a barbarian; a cheap dinner service of Britannia ware, an iron bedstead and counterpanes, a few pieces of cotton prints, boots, etc. For trade it should bring fine blue, black and gray woollen cloths, a quantity of military buttons, gold braid and cord, silk cord of different colors, as well as binding, linen and sheeting for shirts, fine red blankets and a quantity of red cloth, a few chairs and tables. The profit arising from the sale of these things would be enormous.

For the mission's use it should bring with it a supply of hammers,

saws, augers, chisels, axes, hatchets, adzes, carpenters' and blacksmiths' tools, as the Waganda are apt pupils; iron drills and powder for blasting purposes, trowels, a couple of good sized anvils, a forge and bellows, an assortment of nails and tacks, a plough, spades, shovels, pickaxes and a couple of light buggies as specimens, and such other small things as their own common sense would suggest. Most desirable would be an assortment of garden seed and grain; also white lead, linseed oil, brushes, a few volumes of illustrated journals, gaudy prints, a magic lantern, rockets and a photograph apparatus. The total cost of the whole need not exceed £5,000.

HENRY M. STANLEY.

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### STANLEY'S TWELFTH LETTER.

### EXPLORING THE EASTERN SHORES OF THE VICTORIA NIYANZA.

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[From the New York Herald.]

VILLAGE OF KAGEHYI, DISTRICT OF UCHAMBI, }  
COUNTRY OF USUKUMA, *May 15, 1875.* }

By the aid of the enclosed map you will be able to understand the positions and places of the countries mentioned in my last, and of some I shall be obliged to describe in this letter. It is needless to go over the same ground I described in my letter from Uganda; but, since I send you a map, it will be but charity to sketch again briefly the characteristics of the countries lying east between Usukuma and Uganda.

Between the district of Uchambi, which is in Usukuma, and the Shimeeyu river, the principal affluent of the Niyanza, lie the pretty districts of Sima and Magu, governed by independent chiefs. On the eastern side of the Shimeeyu is Masanza, a rugged and hilly country, thinly populated and the resort of the elephant hunters. Beyond Masanza the coast is formed by Manasa and the country is similar in feature to Masanza, abounding in elephants. This extends to the eastern extremity of Speke gulf, when we behold a complete change in the landscape. The land suddenly sinks down into a flat, marshy country, as if Speke gulf formerly had extended many miles inland, as I have no doubt, but rather feel convinced, it did.

This country is called Wirigedi, peopled by savages, who have little or no intercourse with Usukuma, but are mostly exclusive and disposed to take advantage of their strength to rob strangers who visit them. Urrigedi is drained by the Ruana, which discharges itself into Speke gulf by two mouths. It is a powerful stream, conveying a vast quantity of water to Speke gulf, but in importance not to be mentioned in the same category as the Shimeeyu and the Kagera, the two principal affluents of Lake Victoria.

#### SPEKE GULF.

Speke gulf at its eastern extremity is about twelve miles in width. Opposed to the hilly ranges of Manasa and Masanza are the sterile naked mountains and plains of Shashi, Uramba and Urirwi. The plains which separate each country from the other are as devoid of vegetation as the Isthmus of Suez. A thin line only, bordering the lake, is green with bush and cane. The gulf, as we proceed west from Urirwi, is shored by the great island of Ukerewe, a country blessed with verdure and plenty, and rich in herds of cattle and ivory. A narrow strait, called the Rugeshi, separates Ukerewe from Urirwi. The Wakereweh are an enterprising and commercial people, and the King Lukongeh, is a most amiable man. The Wakereweh possess numerous islands. Nifuah, Wezi, Iraugara, Kamassi, &c, are all inhabited by them. Their canoes are seen in Ugeyeya, Usongora and Uzuiza; and to the tribes in the far interior they have given, by their activity and commercial fellowship, their name to the Victoria Nyanza.

Rounding Ukerewe, we pass on our left the island of Ukara, and, sailing past Shizn and Kiveru, come to the northern end of Rugeshi strait, from where we see the towering table-mountain of Majita a little to the north-east of us, the mountains of Urimi and Uramba being in our front.

#### MAJITA NOT AN ISLAND.

I mentioned to you in one of my letters that Speke described Majita as an island, and that I, standing on the same spot, would do so likewise if I had no other proof than my own eyes. As we approach Majita we see the reason of this delusion. The table-mountain of Majita is about 3,000 feet in altitude above the lake, while on all sides of it, except the lake side at its base, are low brown plains, which rise but a few feet above the lake. It is the same case with Urirwi, Uramba, and Shashi. At a distance I thought them islands, until I arrived close to them.

On the northern side of Majita the brown plain extends far inland, and I do believe a great plain or a series of plains bounds the lake-countries east, for we have views distant or near everywhere. In endeavoring to measure the extent of this plain I am compelled to think of Ugogo, for as we traversed its northern frontier we saw each day stretching north the barren thorn-covered plain of Uhumba. On leaving Iramba we came again in view of a portion of it, more recently covered with water, under the name of the Luwamberri plain. As we journey through Usmaow we saw from many a ridge the plain extending north. That part of the plain lying between Urimi and the lake is, of course, drained by the Luwamberri, the Mwaru and the Duma rivers, and discharged into the Nyanza under the name of the Shimeeyu. But north-east of the Shimeeyu's mouth imagine the land heaved into a low, broad and lengthy ridge, forming another basin drained by the Ruana, and still another drained by the Mara, and again another by the Mori, etc. If we ask the natives what lies beyond the immediate lake lands we are assured briefly, *mbuigatu* "only a plain."

From Majita north we sail along the coast of Ururi, a country remarkable for its wealth of cattle and fine pastoral lands. It is divided into several districts whose names you will find marked on the map.

#### THE EL DORADO OF IVORY SEEKERS.

Molunu and Shirati, low, flat and wooded districts of Ururi, separate this country from Ugeyeya, the land of so many fables and wonders, the El Dorado of ivory seekers and the source of wealth for slave hunters.

Our first view of it while we cross the Bay of Kavirondo is of a series of tall mountains, and of a mountainous projection, which latter from a distance we take to be a promontory, but which on a nearer view turns out to be an island bearing a tall mountain on its back. At the north-eastern extremity of this bay is Gori river, which rises north-east near Kavi,—no important stream, but one that grows during the rainy season to large breadth and depth. Far east beyond the Nyanza for twenty-five days march the country is one continuous plain, low hills rising here and there dotting the surface; a scrubby land, though well adapted for pasture and cattle, of which the natives have vast herds. About fifteen days' march east the people report a land wherein low hills spout smoke, and sometimes fire. This wonderful district is called Susa, and is situated in the Masai land.

All combine in saying that no stream runs north, but that all waters come into the Nyanza, for at least twenty days' march. Beyond this distance the natives report a small lake from which issues a stream flowing toward the Pangain.

#### GOSHI'S NOOK OF REFUGE.

Continuing on our way north we pass between the Island Ugingo and the gigantic mountains of Ugeyeya, at whose base the Lady Alice seems to crawl like a mite in a huge cheese, while we on board admire the stupendous height, and wonder at the deathly silence which prevails in this solitude, where the boisterous winds are hushed and the turbulent waves are as tranquil as a summer's dream. The natives, as they pass, regard this spot with superstition, as well they might, for the silent majesty of these dumb, tall mounts awe the very storms to peace. Let the tempests bluster as they may on the spacious main beyond this cape, in this nook, sheltered by tall Ugingo isle and lofty Goshi on the mainland, they inspire no fear. It is this refuge which Goshi promises the distressed canoe-men that causes them to sing praises of Goshi, and to cheer one another when wearied and benighted with the word that Goshi is near to protect them.

Sailing between and out from among the clustering islands, we leave Wategi behind, and sail towards two low isolated islands not far from the mainland, for a quiet night's rest, and under the over-spreading branches of a mangrove tree we dream of unquiet waters and angry surfs and threatening rocks, to find ourselves next morning tied to an island which, from its peculiarity, I have named Bridge island, though its native name is Kihwa.

#### A NATURAL BRIDGE OF BASALT.

While seeking a road to ascend the island to take bearings, I discovered a natural bridge of basalt, about twenty feet in length by twelve in breadth, under which one might repose comfortably, and from one side see the waves lashed to fury and spend their strength on the stubborn rocks which form the foundation of the arch, while from the other he could see his boat secure under the lee of the island, resting on a serene and placid surface, and shaded by mangrove branches from the hot sun of the equator. Its neighborhood is remarkable only for a small cave, the haunt of fishermen.

From the summit of Bridge island the view eastward takes in all Masari as far as Nakidimo, and discovers only a flat and slightly wooded district, varied at intervals by isolated cones, and northward,

at the distance of twenty miles or so, finds the land making a bold stretch eastward. Knowing, however, by past experience that the appearance of the land is deceptive, we hoist our sail and scud merrily before a freshening breeze, hugging the coast lest it should rob us of some rarity or wonder.

#### UNDER THE EQUATOR.

At noon I found myself under the equator, and four miles north I came to discolored water and a slight current flowing to the south-west. Seeing a small bay of sufficient breadth to make a good river, and no land at its eastern extremity, I made sure I had discovered a river which would rival the Shimeeyn; but within an hour land all round revealed the limit and extent of the Bay of Nakidimo. We anchored close to a village and began to court the attention of some wild looking fishermen, but the nude barbarians merely stared at us from under pent-houses of hair, and hastily stole away to tell their wives and relatives of how an apparition, in the shape of a boat with white wings to it, had suddenly come before them bearing strange men with red caps on their heads, except one—a red man, clad in white, whose face was as red as blood, who, jabbering something unintelligible, so frightened them that they ran away. This will become a pleasant tradition, one added to the many wonders now told in Ugeyeya, which, with the art of embellishment inherent in the tongue of the wondering, awe-struck savage, may become, in time, the most wonderful of all wonders.

#### PURSUED BY HIPPOPOTAMI.

Perceiving that our proffered courtesies were thus rudely rejected, we stole out of this snug bay, and passed round to another much larger and more important. At its extremity a river issued into the bay, which, by long and patient talk with the timid natives, we ascertained to be the Ugoweh. In this the hippos were as bold as the human savages were timid, and to a couple of the amphibious monsters we had to induce the *Lady Alice* to show a swifter pace in retreat than the savages of Nakidimo had shown to us. These hippopotami would afford rare sport in a boat specially built for killing them; then they might splinter her sides with their tusks, and bel- low and kick to their utmost; but the *Lady Alice*, if I can help it, with her delicate skin of cedar and ribs of slender hickory, shall never come in close contact with the iron-hard ivory of the hippopotamus, for she would be splintered into matches and crushed like an egg



before one could say "Jack Robinson," and then the hungry crocodiles would leisurely digest us. The explorer's task, to my mind, is a far nobler one than hunting hippos, and our gallant cedar boat has many a thousand miles to travel yet before she has performed her task.

#### WHAT THE LADY ALICE HAS YET TO DO.

The yet unknown expanse of the Victoria Nyanza, northward and westward, and south-westward, invites us to view its delights and wonders of nature. The stormy Lake Albert and the stormier Tanganyika, though yet distant, woo us to ride on their waves; and far Bangweolo, Moero and Kamolondo and the Lincoln lakes, promise as fair prospects and as rich rewards if we can only bide the buffets of the tempests, and the brunt of savage hostility and ignorance till then. Shall we forego the vantage of all this ripe harvest and acquisition of knowledge for an hour's fierce pleasure with the simple but full-muscled hippopotamus? Not by my election or consent. Let the admirers of the Field, Bell's Life and the Spirit of the Times call it faintheartedness, or even a harsher name, if they will. I call it prudence. But I have an adventure with a hippo—a cowardly, dull-witted, fat-brained hippo (I can abuse him savagely in your columns, for his brothers in Europe, thank fortune, do not read the Telegraph or the Herald, without fear of a civil or criminal suit for libel), to tell some day, when I have no higher things to write of, which will warm all your bloods; and I have had another with a lion, or I should say a herd of lions, just as exciting. But these must remain until I camp under the palms of Ujiji again, with half my work done, and my other half still undone. Let us pass on, however, to our subject, and the place where I left off—namely, coward-like, running away from a pair of bull hippos. I am not sure they were bulls either, though they were hippopotami, sure enough.

#### A NARROW ESCAPE.

We flew away with a bellying sail along the coast of Maheta, where we saw such a dense population and clusters of large villages as we had not seen elsewhere. We thought we would make one more effort to learn of the natives the names of some of these villages, and for that purpose steered for a cove on the western shore of Maheta. We anchored within fifty yards of the shore, and so lengthened our cable that but a few feet of deep water separated us from the shore. Some half a dozen men wearing small land shells above their elbows

and a circle round their heads, came to the beach. With these we opened a friendly conversation, during which they disclosed the name of the country as Maheta in Ugeyeya; more they would not communicate until we should land. We prepared to do this, but the numbers on the shore increased so fast that we were compelled to pull off again until they should moderate their excitement and talk. They seemed to think that we were about to pull off altogether, for suddenly appeared out of the bush on each side of the spot we had intended to land such a host of spears that we hoisted our sail and left them to whet their treachery on some other boat or canoe more imprudent than ours. The discomfited people were seen to consult together on a small ridge behind the bush lining the lake, and thinking, no doubt, we were about to pass close to a small point at the north end of the cone, they shouted gleefully at the prospect of a prize; but, lowering the sail, we pulled to windward, far out of the reach of bow or sling, and at dusk made for a small island, to which we tied our boat, and where we camped in security.

#### COASTING ALONG NDURU AND WANGANO.

Next day we continued on our course, and coasted along Nduru and Wangano, and sailed into the bay which forms the north-eastern extremity of Lake Victoria Nyanza. Manyara, on the eastern side of the bay, is a land of bold hills and ridges, while the very north-eastern end, through which issues the Yagama river into the Nyanza, is flat. The opposite coast to Manyara is that of Muwanda and the promontory of Chaga, while the great slug-like island of Usunguru, standing from west to east across the mouth, shuts the bay almost entirely in.

At Muwanda we again trusted our fortunes with the natives, and were this time not deceived, so that we were enabled to lay in quite a stock of vegetables and provisions at a cheap rate. They gave us all the information we desired. Baringo, they said, is the name applied by the people of Ugana to Nduru, a district of Ugeyeya, and the bay on which our boat rode was the extreme end of the lake, nor did they know or had heard of any lake, large or small, other than the Nyanza.

I described the coast from Muwanda to Uganda, and my visit to Mtesa, with my happy encounter with Colonel Linant de Bellefonds, of Gordon's staff, at some length, so I need not go over the same ground.

## FROM USUKUMA TO THE KATONGA RIVER.

The day after my last letter was written I made arrangements with the king of Uganda, by which he agreed to lend me thirty canoes and some 500 men, to convey the expedition from Usukuma to the Katonga river. With this promise, and ten large canoes as an earnest of it, I started from Murchison bay on April seventeenth. We kept company as far as the Katonga river, but here the chief captain of the Waganda said that he should have to cross over to Sesse, distant twelve miles from the mainland, and the largest island in the Lake Nyanza, to procure the remaining twenty canoes promised by Mtesa. The chief gave me two canoes to accompany me, promising that I should be overtaken by the entire fleet before many days. I was impatient to continue my survey of the lake and to reach Usukuma, having been so long absent from the expedition, during which time many things, contrary to my success and peace of mind, might have occurred.

## SPEKE'S LATITUDES CORRECTED.

I took my observations twice a day with a sea horizon — one at noon for latitude, and one in the afternoon for longitude — and I am sorry to say that, if I am right, Speke is about fourteen miles wrong in his latitude along the whole coast of Uganda. The mouth of the Katonga river, for instance, according to his map, is a little south of the equator. I have made it by meridian altitude, observed April twentieth, to be in latitude  $0^{\circ} 16' 0''$  north. Thus it is nearly with all his latitudes. His longitudes and mine vary but little; but this is easily accounted for. The longitude of any position can be taken with a chronometer, sextant, and artificial horizon with the same accuracy on land as on sea. If there is any difference it is very likely to exist in the error of the chronometers. What instruments Speke possessed to obtain his latitudes I know not, but if he found the altitude of the sun ascending above  $65^{\circ}$  he could never obtain it with an ordinary sextant except by double altitude, and that method is not so exact as taking a simple meridian on a quiet lake, with an ample horizon of water. But there are various methods of determining one's latitude, and Speke was familiar with many. My positions all round the lake have been determined with a sea horizon. When near noon my plan was, if the lake was rough, to seek the nearest island or a quiet cape at the extremity of a bay, and there take my observations as deliberately as though my life depended on their accuracy.

## THE MAP.

But this task was, indeed, a work of pleasure for me, and I have found a rich reward for most of my pains and stormy life on this lake in looking at the fair extent of white on my map, with all its bends, curves, inlets, creeks, bays, capes, debouchures of rivers, etc., known by the name of Victoria Nyanza. Any errors which may have crept into my calculations will be determined by competent authorities on my return from Africa, or on the arrival of my papers in Europe. Meantime I send my map as I have made it.

The Katonga is not a large river, and has but one mouth. The Amionzi river empties itself into the Nyanza about eight miles west-south-west of the Katonga.

Uganga stretches to the Kagerah, situated in south latitude  $0^{\circ} 30'$ . On the south side of the river begins Usongora, extending to south latitude  $1^{\circ}$ . South of  $1^{\circ}$  is Kamiru, extending to south latitude  $1^{\circ} 15'$ .

Thence is Uwya, a country similar in enterprise to Ukerewe's people. Beyond Uwya is Uzinja or Uzinza, called Mweri by the Wanyamwezi.

## RETURN TO KAGEHYI.

Uzinja continues as far south as Jordan's Nullah, and east of it is Usukuina again, and one day's sail from Jordan's Nullah, passing Muanza, which Speke reached in 1858, brings us home to Kagehyi and to our camp, where we are greeted joyfully by such as live to mourn the poor fellows who, in my absence, have been hurried by disease to untimely graves.

I must be brief in what I have to say now. I did think to make this a long letter, but Singoro's slave, who carries this, is in a hurry to go, as his caravan has already started.

## THE NEXT LETTER.

My next letter must continue this from the Kagera river, called in Karagwe the Kitangule, and it shall describe some foul adventures that we went through, which caused us to appear in a wretched condition to our expedition. Though our condition was so wretched, it was not half so bad as it would have been had we returned two days later, for I doubt much whether I should have had an expedition at all. I had been absent too long, and our fight with the Wavuma had been magnified and enlarged by native rumor to such a pitch that Wolseley's victory at Ardahsu was as nothing to ours, for it had been

said that we had destroyed a whole fleet of canoes, not one of which had escaped, and that some other tribes had collected a force, overtaken us, and destroyed us in like manner — an incredible story, which had so won upon a faction of the soldiers that they had determined to return to Unyanyembe, and thence to Zanzibar. But God has been with us here, and on the lake, and, though we have suffered some misfortunes, He has protected us from greater ones.

We had been absent from camp fifty-eight days, during which we had surveyed, in our brave little boat, over 1,000 miles of lake shores; but a part of the south-west coast has yet to be explored. We shall not leave the Niyanza, however, until we have thoroughly done our work.

#### FREDERICK BARKER'S DEATH.

I returned to find also that one of the white men, Frederick Barker, of the Langham hotel, London, had died on the twenty-third of April, twelve days before I reappeared at Kagelhi. His disease was, as near as I can make out from Frank Pocock's description, a congestive chill — that is the term applied to it in the States. Pocock calls it "cold fits," a term every whit, I believe, as appropriate. I have known several die of these "cold fits," or anguish attacks — the preliminary symptoms of severe attacks of the intermittent fever. These anguish attacks, however, sometimes end the patient before the fever arrives, which generally follows the ague. The lips become blue, the face bears the appearance of one who is frozen, the blood becomes, as it were, congealed, the pulse stops, and death ensues. There are various methods of quickening the blood and reviving the patient. However, a common one is to plunge him into a vapor or hot water and mustard bath, and apply restoratives — brandy, hot tea, etc.; but Pocock was not experienced in this case, though he gave Barker some brandy after he lay down from feeling a slight nausea and chill. It appears, by his companion's report, that he did not live an hour. Frederick Barker suffered from one of these severe anguish attacks in Urimi, but brandy and hot tea quickly given to him soon brought him to that state which promises recovery, and is followed by rapid convalescence.

#### THE PROSPECT AHEAD.

Thus two out of four white men are dead. I wonder who next? Death cries, Who next? and perhaps our several friends ask, Who next? No matter who it is. We could not better ourselves by

attempting to fly from the fatal land; for between us and the sea are 700 miles of as sickly a country as any in Africa. The prospect is fairer in front, though there are some 3,000 miles more to march. We have new and wonderful lands before us, whose wonders and mysteries shall be a medicine which shall make us laugh at fever and death.

HENRY M. STANLEY.

## M. LINANT DE BELLEFONDS' ACCOUNT OF STANLEY'S VISIT TO KING M'TSE'S CAPITAL.

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[From the New York Herald, January 26, 1876. (From the London Telegraph, Jan 12.)]

We have received from Cairo the remaining portion of the report made by M. E. Linant de Bellefonds to the Egyptian Minister of War respecting his visit to King M'tsé's capital, and his meeting there with Mr. Stanley. This document has a double interest, both as giving well-nigh the latest intelligence at present to hand from the Joint Commissioner of the New York Herald and Daily Telegraph, and also as containing, together with some admirably vivid sketches of the country and people, the last written words of a young and most promising officer, whose loss has been deeply deplored by Colonel Gordon and the Khedive. We, therefore, translate the official letter in full:

### STANLEY LEAVES KING M'TSÉ'S CAPITAL FOR USUMVA.

UGANDA, THURSDAY *April 15, 1875.*

Mr. Stanley is leaving us in order to accomplish the work of exploring the western side of the lake, thereafter intending to return to Usukuma to pick up his followers and the goods left at Kagehyi. I have arranged to accompany him as far as Usavara, the point of embarkation in Murchison bay. We start together, therefore, this morning, I having lent one of my mules to my friend and ordered ten of my soldiers to escort us.

### ON THE WAY — MAGNIFICENT SCENERY.

We commence the journey by rounding the hill upon which his majesty resides, and then bend our steps southward with a slight easterly inclination. All the way along our route we see gardens luxuriant with the banana and sweet potato. We have to cross a canal into which all the mud of the country appears to have gathered, It has a breadth of forty meters at the point where we cross, and there is a bridge of roughly cut logs and branches thrown over it; but, though people on foot may find the passage rendered easier by this

construction, it is badly adapted to our mules, which lose their balance on the smooth and shifting trunks, with the result of pitching into the mud and water. However, we manage to haul them out and to get ourselves over, and then after two hours' march, we climb a hill with a steep incline. The road is bordered on both sides by impenetrable thickets, the hiding place of leopards and hyenas, where certainly no one is likely to interfere much with the digestion of their prey. Arrived at the top of this eminence the beautiful view makes us quickly forget all the fatigues of the ascent. Under our feet, the magnificent lake stretches out, sparkling like a cloth of silver; numerous green islands, softly rounded and indented, shut in the bay with a girdle as of emeralds; while along the shore are masses of darker green dotted about, these being groves of huge timber trees, which bathe their roots and branches in the fresh and limpid wavelets of the Victoria. Eastward a silvery ribbon hurries to lose itself in the lake; it is the canal which we have lately crossed. The scene is enchanting, absorbing; the heart must swell with pleasure within the breast of any admirer of natural beauty who gazes upon it. We feel a keen desire to descend and approach nearer to this lovely coast whose charms ravish us, and, after a quick advance of less than an hour, the ripples of the quiet Nyanza are breaking at our feet.

#### TEMPERANCE AND PATRIOTISM.

Everybody stoops to drink of the clear water, and Mr. Stanley and I toast our respective countries in the refreshing liquid.

#### STANLEY BAPTIZES A BOULEVARD.

We are here at Usovara, a hunting station of King M'tsé, who frequently repairs to the spot in order to exercise his shooting powers upon the crocodiles. Numberless huts and gardens appear around us, and among them his majesty has a "shooting box" which covers an area of several kilometers.

There is a broad approach which Mr. Stanley christens the "Avenue des Champs Elysées," lined on each side by the dwellings of the royal guards, and it leads to the king's abode. This approach is about a mile in length, M'tsé's lodge turning out to be a connection of huts, each encircled by a fence, while all around are scattered the lodgings for his escort.



## THE ROYAL DWELLING.

Certainly to judge by the precautions here displayed for the royal security, his majesty must sleep rather uneasily. We examine the king's premises minutely, for there is nobody about, not even a watchman, and we take possession for a time of the best of the huts reserved for the royal suite when M'tsé comes to Usovava.

## A ROYAL SQUADRON FOR THE USE OF THE AMERICAN.

Mr. Stanley has been promised by the king the use of thirty canoes to accompany him to the Usukuma and to bring back to Usovava his expedition and equipments. The high admiral of Uganda, in person, is to accompany them; but it is already four o'clock, and we see nothing either of the fleet or the official.

## DOMESTIC GRIEF TO THE NATIVE ADMIRAL.

News presently arrives that the delay is caused by a sad domestic calamity which has befallen the chief of the Uganda navy, and it turns out that, having arrived over night near Usovava with all his female establishment, the admiral has had all his wives fetched back by order of the king, his majesty declaring that it was highly irregular to make a pleasure party of that which was intended as a matter of important service.

To-morrow, they say, all will be in readiness.

## A PROMENADE AND OBSERVATIONS.

Mr. Stanley and I devote ourselves accordingly to a promenade along the lake, in the course of which we behold, with admiration, enormous trees that might afford cover, with their thick shade, to 500 people at once. Parasitical plants climb over the trunks and branches of these Titans of the forest, and if you make an incision into the bark or roots there exudes a resinous gum which appears very similar to the "mastic" that the Cairo women chew.

## THE SOIL.

At the edge of the lake is a mineral detritus, rich in oxide of iron, and upon it grows closely a thick and soft moss of yellowish green, composing a carpet as agreeable to the eye as to the foot.

## ACCOMMODATION DURING THE NIGHT.

FRIDAY, *April 16*, 1875.

My bed last night left much to desire. It was made of dry grass, with a bag of potatoes for the pillow. Such was my simple couch, for, as I had intended to return before nightfall, I did not take with me the least thing in the way of coverlid. Mr. Stanley most kindly pressed upon me his "engareb" and railway rug, but I could not think it right to rob him of them. Imperfect, however, as my sleeping arrangements were, I reposed soundly, and that in spite of mosquitoes and fleas, of which there were a few of the former, but perfect hordes of the latter.

## THE SQUADRON IN SIGHT — APPEARANCE OF THE VESSELS.

At four in the morning the squadron which was to escort my friend down the lake made its appearance, and assuredly the vessels of King M'tsé are curious, if not imposing. Each canoe is about ten to twelve meters in length, with a beam of one or one and a half. It is made up of many lengths of hewn plank, fastened by withes of osier, the seams being calked with bark and mud. As a consequence of this very defective method of construction, the Wagandas have never been able to make themselves masters of the island of Uvuma. As soon as any war-canoe approaches that place the islanders rush forth into the water, armed with knives, swim to the vessel, dive under it and cut the withes which hold the affair together. The canoe thus falls apart, and its crew perish either by drowning or by the weapons of the Wayumas.

## THE SHAPE

of these Waganda canoes resembles that of the Venetian gondola. The stern has a high sheer, and forms the seat of the helmsman, who steers with a paddle, sweeping it now to the right, now to the left, according to the course which he desires to take. The stern-piece is rounded and gracefully bent into the form of a swan's neck, two antelope horns being fixed upon it, so that with the long curved neck and the horns a very strange effect is produced, especially when the boat is coming straight on; almost, in fact, as if some antediluvian creature were gliding toward you over the waters, and raising its head watchfully on high to follow some prey upon which it means to dart.

None of these crafts carry sails; and, indeed, the use of the latter is unknown among the Waganda.

The boats are propelled by paddles, the crew sitting two by two, and varying in number from fourteen to twenty-four, in accordance with the size of the boat.

#### A CRUISE IN THE LADY ALICE.

A considerable division of the promised fleet having now arrived we resolved to make a preliminary excursion upon the bay. Mr. Stanley ordered his vessel, the *Lady Alice*, to be got in readiness. She is a beautiful little craft, built of cedar, and constructed in water-tight sections, so as to be readily taken to pieces and put together again. I went on board with my companion, and all the canoes started at the same time, vying with each other to be ahead. They soon outstripped us, and then set to work paddling round and round the *Lady Alice* like so many tritons.

#### THE COMMANDER'S FLAG.

On board one of them was the admiral, and the official drum of that magnate kept noisily beating, at one time commanding the fleet to gather about the "flag canoe," at another sending them off, helter-skelter, in all directions.

#### THE NIYANZA.

On one side stretched the boundless surface of the Niyanza, on the other extended the shore which we had just left, presenting together the gayest and most charming spectacle imaginable. The knolls and hillocks round the lake, each covered with a robe of tender green, and bathing its base in the shining waves, suggested so many water-goddesses reclining on the sunlit grass and dabbling their feet in the cool and limpid ripples. I, indeed, was off and away in fancy, a thousand leagues from life's realities; and both Stanley and myself sat wrapped in a long silence, trying to satiate our eyes and minds — without succeeding — upon those prodigal glories of nature which stretched far and wide about us.

#### INVALIDED.

Unhappily, after returning to camp, I was seized with a frightful attack of neuralgia, and am sadly afraid that I must have proved a far from agreeable associate for my good friend during the remainder of that day. Mr. Stanley and the admiral of the Uganda fleet had fixed upon the following morning for their start, but that naval worthy was, meanwhile, in despair, not having heard a word about his con-

fiscated wives. It was too much to be feared, indeed, that his majesty had added them pellmell to that division of his forces in which the effective list perpetually exceeds the estimates.

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## THE AMERICAN EXPLORER'S DEPARTURE.

*April 17, 1875.*

I have passed a horrible night. A most pitiless headache prevented me from snatching a moment of repose until daybreak. From the time when I lay down till three in the morning I tried to get asleep, reclining upon the moss by the side of the lake and breathing the cool air from the water. The night was glorious, and my soldiers spent most of it in chatting and joking by the shore, or taking dips in the calm surface in spite of the crocodiles; they had, in truth, a lively interest in a certain hind-quarter of mutton which they were roasting whole over a fire upon a sharpened stake.

At three in the morning their banquet was about ready, and just then I rose and went back to the huts, where Stanley was sleeping soundly. Shortly afterward, fatigue overpowering my headache, I, too, managed to close my eyes, and slumbered till five o'clock.

## THE ANGLO-AMERICAN FLAG — AWAY FOR THE SOUTH.

At that hour the drums woke me, striking up on board the Waganda fleet, which was assembled to convoy my friend. He and I very soon made our toilets; the Lady Alice was got ready, the luggage, sheep, kids, chickens, and every thing on board. It only remained to hoist the Anglo-American flag and turn the vessel's head to the far south.

### ADIEUX.

I went down with him to the side of his craft, and then we pressed hands together and mutually commended each other to the protection of Heaven.

Stanley stepped on board and took the helm; the Lady Alice curveted and danced like a high-bred steed, and then darted away with the Victorian wavelets foaming white under her bows. The flag over my friend's head flew proudly out in the African breeze, and I saluted it with all my guns. If not an imposing salvo, let me say that it never was saluted with more hearty good-will. Further and further flew the pretty Lady Alice. We waved our hands and handkerchiefs in token of last adieu, and — I confess it — my heart was

full. I felt as one that has parted with a brother, for I had already grown fond of Stanley as a fine-hearted fellow, a frank, excellent comrade, and a first-rate traveler. In his society I had forgotten my fatigues; and then, too, till I met him, I had not spoken one single word of French for four months. Our encounter had thus produced for me almost the effect of a return to my native land. His conversation — amusing, pleasant and instructive — made the hours of our friendship pass like minutes.

I do hope to see him again, and to spend many a happy day with him.

#### SAD AND GLOOMY.

We turned aside from the waters which had just borne Stanley far away, and nobody seemed in the mood for chatter, so that we all followed in silence the road to Ulagala.

I arrived at Dubaga at eleven o'clock, and there heard that the greater part of my soldiers were down with fever, that no provisions had been sent during my absence, and that four of our cows had been lost by the herdsmen. The chief offender received 100 blows of the stick, as he was suspected of having sold the animals, and I wrote to Mtesa that my people were suffering with hunger. I demanded, at the same time, an authorization to return to Foweira, an answer to which soon came in the form of twelve cows and a quantity of eggs.

My headache returning, I went directly to bed.

# REMARKS ON STANLEY'S VERIFICATION OF PTOLEMY'S GEOGRAPHY.

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By CHIEF JUSTICE DALY, LL. D.

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BEFORE THE AMERICAN GEOGRAPHICAL SOCIETY, NOVEMBER 14, 1875.

Chief Justice Daly, in speaking of the efforts made to solve the great mystery of the Nile's source, said: The evening being devoted to Africa, I cannot suffer it to pass without noticing the important results thus far of the expedition of Mr. H. M. Stanley, sent out by the New York Herald and the London Telegraph. After a journey of great peril, attended by the loss of about half his command, and which was carried through by the indomitable perseverance and courage by which Mr. Stanley has hitherto been distinguished, he succeeded in reaching the southern shore of the Victoria Nyanza, where Speke's great discovery was made, and has been able with a small vessel to explore the eastern side of the lake, hitherto unknown; and, as Speke and Grant in 1861 explored the western side, the result of Mr. Stanley's successful efforts is that the whole of the lake is now known, and the streams that flow into it. It is impossible to over-estimate the value of this exploration, as it brings the long-vexed question of the source of the Nile nearer to a solution than anything that has yet been done.

Mr. Stanley, when last heard from, was on the northern shore of the lake, and has announced his intention to proceed from thence with his little vessel to explore the Albert Nyanza. If his life shall be preserved, and, succeeding in this further exploration, he should find that the Albert Nyanza is in communication with the Lualaba of Livingstone, and thereby connected with the great net-work of rivers and lakes traced by Livingstone, of which the Lualaba is a part, then the Nile will not only prove to be the longest river in the world, but the outlet of the most extensive and the most extraordinary water system upon the globe. If, on the other hand, as is highly probable, he should find that the Albert Nyanza is not connected with any great water system south of it, but is an independent lake, flowing into the Nile, the southern part of which is simply supplied by streams

rising in the land immediately about it, then the source of the Nile will have been ascertained, and a question settled that has agitated the world for more than 2,000 years.

Aristotle declared 2,000 years ago, upon information the source of which we do not know, that the Nile took its rise in a mountain called the Silver Mountain, which he placed near the equator, not far from the parallel of the island of Menuthias, the modern Zanzibar.

#### THE REBMANN AND KRAPF DISCOVERIES.

This mountain appears to be the same mentioned by the Arabian geographers in the Middle Ages as the White Mountain, and both undoubtedly refer to Killmanjaro, discovered by the missionaries Rebmann and Krapf in 1848, which is a mountain 22,000 feet high, lying to the south and east of the Victoria Nyanza, about three degrees below the equator, with a dome-like summit, capped with snow, which, when free of clouds and in the sunshine, has the appearance of a dome of silver. These missionaries also discovered another great snow-capped mountain, Kenia, east of the Victoria Nyanza, and one degree south of the equator, of larger size, if not of greater elevation, than Killmanjaro, which Dr. Krapf describes as rising into a huge wall with a gigantic roof, above which rise close to each other two immense horns, as he calls them, or mighty towers, giving to the whole such a grand and majestic look that he was overwhelmed at the sight of it. They also found other mountains, denoting an extensive range, of which Kenia and Killmanjaro are the most elevated peaks, and Dr. Krapf was of the opinion that the snow melting from these huge mountains, with the tropical rains of that region, supplied the waters which formed the Victoria Nyanza, and were the remote source of the Nile. They found a multitude of rivers rising amidst these snow-capped mountains. Rebmann counted twenty flowing from the heights of Killmanjaro, none of which, however, flowed westward; but they found that rivers flow north and west from Mount Kenia; and Dr. Krapf thought that it was these rivers that formed the Victoria Nyanza, and that the immediate source of these rivers was the marshy and wooded country of the Waman people, east of the lake. This suggestion that Mount Kenia, with its two great horns or immense towers, is the elevated land from which the streams rise that flow into the Victoria Nyanza, recalls the statement of Herodotus that he was told by the scribe in Egypt, who kept the sacred treasures of Minerva, that the fountains of the Nile were midway between two hills with sharp, conical tops, one of which was named

Alphi and the other Maphi, to discover which fountains was the constant object of Livingstone. I mention these circumstances for their bearing, as I shall presently show, upon Mr. Stanley's discoveries, but before doing so shall refer to a few other facts.

Ptolemy, whose geography was written in the middle of the second century of our era, says: "On the western boundary of the Anthropagi are the Mountains of the Moon, whose snows are received by the marshes of the Nile."

In the maps of Agathodæmon, of Alexandria, prefixed to the edition of Ptolemy of 1478, and which are supposed to be contemporaneous with Ptolemy, the Nile is represented as flowing from two lakes lying parallel with each other, about eight degrees south of the equator, which are supplied by streams represented as rising from a chain of mountains that are called upon the map the Mountains of the Moon.

In my anniversary address after the discovery of the Victoria Nyanza by Speke, and of the Albert Nyanza by Baker, you may remember that I expressed the belief that these lakes were merely re-discoveries; that Speke and Baker had simply found the two lakes laid down in the old map of Africa prefixed to the geography of Ptolemy, and that, although placed in the early map some six degrees further to the south than where they were found, they were evidently the same lakes, as Ptolemy had made many errors in respect to the position of places both north and south of the equator, as, for instance, in the case of Cape Guardafui, which he placed six degrees further south than it is. The view I then expressed was not at first very favorably received, which led me to investigate further, and I found that these two lakes were not only known to Ptolemy, or to his cartographer Agathodæmon, but that the Arabian geographers from the ninth to the eleventh centuries, represented on their maps as the source of the Nile a large lake upon the equator, in exactly the same position as the Victoria Nyanza, and what is the more remarkable, with a large island in it, which it has, Ukerewe, around which Mr. Stanley sailed last March.

This lake on the equator, with its islands and streams flowing into it from what are called the Mountains of the Moon, is found on the Arab map prefixed to the Rasm, A. D. 835; in that of Abui Hassan, A. D. 1008, and of Birunensis, A. D. 1030. In the map of Edrisio, A. D. 1154, it is retained in the same position upon the equator, but two lakes, corresponding to the lakes of Ptolemy, are represented below it, with streams running into it. My belief is that



the existence of the Victoria Nyanza as a large lake, directly upon the equator, was then well known to the Arabs, and it may be that they knew that there was another great lake (Albert Nyanza), which was also a fountain or reservoir of the Nile, and that Edrisio, in attempting, in the composition of his great work, to reconcile what was known with the two lakes placed on Ptolemy's map eight degrees farther south, erroneously adopted three lakes as the solution of the difficulty.

Three lakes being now introduced, justly led to confusion for four centuries afterward among geographers and cartographers. Some adhered to the one lake upon the equator; others adhered exclusively to the two lakes as represented upon the Ptolemaic map; others, like Magrebinus, united the three into a great lake upon the equator, and made it the source alike of the Nile and the Congo, while others rejected the lakes altogether, until at last cartographers settled down upon the two lakes in the Ptolemaic map until the middle of the last century, when, in consequence of the reform in cartography introduced by D'Anvilles of excluding everything that was not certain, these two lakes were omitted in all future maps, and, when discovered a century afterward by Speke and Baker, had been forgotten.

We have then the statement of Ptolemy that the Nile rises in marshes formed by streams descending from what he calls the Mountains of the Moon, with the representation by his cartographer that these streams form two great lakes lying nearly parallel to each other, from which the remotest branch of the river, the White Nile, flows. We have also the opinion of the missionary Krapf that the marshy and woody lands east and south-east of the Victoria Nianza supply the waters which flow into it, and that these marshes are fed by streams descending from Mount Kenia and its vicinity. The information of Herodotus is that the fountains of the Nile were midway between "two hills with sharp conical tops," although the position assigned to them by the scribe who gave the information to Herodotus is much farther down the river. I may add also that the late Dr. Baker, an African explorer and a distinguished geographer, was of the opinion long ago that the missionaries Rebmann and Krapf had, in Killimanjaro and Kenia and the mountain range connected with them, discovered Ptolemy's Mountains of the Moon.

Now to apply these facts to Mr. Stanley's discoveries. Mr. Stanley's first letter detailing his exploration along the eastern shores of the Victoria Nyanza has not yet been received in this country, the

French officer to whom it was entrusted having been killed, although it has since been found and we shall ere long know its contents. What we have are his second letter and his map, which are sufficient for my present purpose. They show that a large river, the Shimeeyu, estimated by him to be 350 miles in length, flows into Speke's gulf at the south-eastern end of the Victoria Nyanza; that it is the chief affluent of the lake, and that seven rivers flow into the lake on its eastern side; that a rugged and hilly country extends from Uchambi, on the south of the lake, to the eastern extremity of Speke's gulf, when a complete change occurs, the land suddenly sinking down into a flat, marshy country, with the indication that Speke's gulf formerly extended many miles inland; this marshy country being drained by a powerful stream, the Ruana, which empties into Speke's gulf. Then follows along the eastern shore a sterile range of mountains, devoid of vegetation; that after he passed the table-mountain of Majita, on all sides of which he found low barren plains extending far inland, with an impression on his part that a great plain or series of plains bound the lake country east, he then passed portions of country covered with water. When he asked the natives what lay beyond the immediate lake-lands, the answer was, "Only plains." Again, northward, he passed low, flat and wooded districts until he reached the tall mountains of Ugeyeya and the river Gori, which swells in the rainy season to a great breadth and depth, and learned that far and east for twenty days' march the country is a continuous plain, where no stream runs north, but all flow into the Victoria Nyanza. Upon approaching the north-eastern end of the lake, and after passing the island of Ugingo, he came to gigantic mountains, along the base of which the little vessel sailed, and beyond this all that was seen was a low, flat, wooded country to the equator, and at the north-east end of the lake the land was flat through which a river flowed into the lake.

This exploration indicates, in my opinion, the marshes of Ptolemy, the marshy and wooded land mentioned by Dr. Krapf, and that the mountain regions east and south-east of it from Kenia to Killmanjaro are, as Dr. Baker supposed, Ptolemy's Mountains of the Moon, ending with Killmanjaro, the Silver Mountain known to Aristotle. It further indicates that Stanley has come upon the real and ultimate source of the Nile, but opinion upon that subject must be suspended until he has explored the southern shores of the Albert Nyanza. The discovery of the source of the Nile has been so frequently assumed that

it is scarcely safe to conjecture while any thing remains unexplored which is essential to the problem.

I cannot, however, resist the conviction that Stanley has reached the source, and that it is found to correspond with what Aristotle and Ptolemy stated respecting it. If this should, as I apprehend it will, prove to be the fact, then it illustrates the difficulties that attend the acquisition of geographical knowledge by showing that our modern explorations and discoveries have only verified what was known 2,000 years ago.

# MEETING OF THE AMERICAN GEOGRAPHICAL SOCIETY, NOVEMBER 15, 1875.

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## REMARKS ON EXPLORATIONS IN CENTRAL AFRICA.

By CHIEF JUSTICE DALY, LL. D., and Mr. BAYARD TAYLOR.

Among those present were Mr. Cyrus W. Field, Rev. Dr. Adams, Peter Cooper, Hon. John Jay, late minister to Vienna; Simon Bernheimer, Rev. Dr. R. D. Hitchcock, Col. Thomas C. Acton, James W. Beekman, Francis A. Stout, Gen. George W. Cullum, Robert L. Stuart, S. B. Ruggles, Col. T. Bailey Myers, William Remsen, Walton W. Evans and W. H. H. Moore.

The meeting was called to order by Chief Justice Daly, and on motion the reading of the minutes and other routine business was dispensed with.

Mr. Samuel B. Ruggles offered a resolution to appoint a special committee of five members to examine and report at a future meeting of the Society upon the leading features of the Mississippi, the Amazon, the Ganges and other great rivers in their relation to the commerce of the globe. It was adopted.

Gen. George W. Cullum offered the following report:

AMERICAN GEOGRAPHICAL SOCIETY,  
NEW YORK, *December 13, 1876.* }

The committee of the Council of the American Geographical Society, Chief Justice Daly, president; Colonel Conkling and General Cullum, vice-presidents; to whom was referred the communication of Mr. James Orton on the exploration of the River Beni, in South America, have the honor to report the accompanying preamble and resolution for the approval of the Society:

*Whereas*, The opinion of the Society has been asked respecting the utility of an expedition to the River Beni, in South America, and the same having been referred to a committee for investigation, and the committee having reported, be it, therefore

*Resolved*, That in the opinion of this Society an exploration of the

Beni, the greater part of the course of which is unknown, the lower and principal portion never having been explored, is desirable, both in a geographical and commercial point of view; that as it is an important tributary of the great water system of South America, its exploration would be a valuable contribution to geographical knowledge, and as it flows through a very rich and productive country and would, should it prove to be navigable, open up that region to the commerce of the world, and be of especial advantage to the commerce of the United States; that its exploration, in the opinion of the Society, would entirely justify the very moderate expenditure requisite for the fitting out of such an expedition.

On motion, the resolutions were adopted.

#### CHIEF JUSTICE DALY'S ADDRESS.

Chief Justice Daly gave a description of the various exploring expeditions which, during the last quarter of a century, have imparted so much information respecting the great water system of Central Africa, the regions through which it flows, and the people that inhabit them, concluding with an account of Mr. Stanley's explorations and discoveries, which were explained upon a map constructed for the Society. He then described the part of Africa between the Victoria Nyanza and the eastern coast, extending from about the fifth degree of south latitude to the southern limits of Abyssinia. It is estimated to contain about 8,000,000 of people, composed of many tribes, the northern ones being known by the general name of Gallas — a fine physical race, who have always maintained their independence, and are spread over a large extent of country, but a small part of which had been explored. He said that to the missionaries Krapf, Rebmann, Wakefield and New, we owe whatever knowledge we at present possess of the interior of this part of Africa. It had been ascertained, through their explorations, that a great mountain range extends from the equator, and probably much further north, to about the fifth degree of south latitude, and that it is the most elevated mountain region, so far as known, in Africa. This range, he said, lay about midway between the Victoria Nyanza and the eastern coast, the highest points of it being the two lofty snow-crowned peaks of Kenia and Killimanjaro, which were over 18,000 feet in height. He described this whole region as remarkable for the sublimity of its scenery, the picturesqueness of its valleys and plains, its many rivers, its great fertility, and for its salubrity, being one of the healthiest parts of Africa. The portion lying between

the western slope of this mountain range and the Victoria Nyanza has never been explored by civilized men, although constantly traversed by Arab traders, there being several caravan routes to the Victoria Nyanza to the north of it.

The information collected by the missionaries Wakefield and New corresponds with that obtained by Mr. Stanley in his exploration of the eastern coast of the Victoria Nyanza. The country along the shores of the Victoria Nyanza, and far east of it toward the mountains, was reported to them to consist chiefly of fine, open, level tracts of meadow-land backed with forests, and as being well watered by numerous streams, and abounding in wild animals of every description. Mr. New, in his ascent of Killimanjaro, in 1863, ascertained that several streams run from the south of that mountain into a lake called Jipe that ran into the River Pangani, which empties upon the eastern coast about  $5^{\circ} 20'$  south latitude; that a river also flows from the western slope of Killimanjaro in a westerly direction, about a degree south of the position of the Victoria Nyanza, which is called the Ngara-da-Erobet, or the Cold Water. Mr. New also ascertained that a very large river, called the Ngara-da-Vash, or Broad Water, flows from about the parallel of the latitude of Kenia, and a little west of the  $36^{\circ}$  of east longitude, and thence south-westerly, entering the Victoria Nyanza at its southern extremity, in about the locality where Stanley found the mouth of the Shimeeyu. Judge Daly pointed out this river as laid down on Mr. New's map, which was exhibited, and suggested that this might be the same river as the Duma, which is shown on Mr. Stanley's map, flowing from the west, uniting to form the Shimeeyu, the Duma on Stanley's map appearing to be a wide river.

The country between this great mountain range and watershed and the Victoria Nyanza is peopled by two great tribes, the Masai and the Wakawari, who are generally at war with each other. The Masai dwell nearest the lake; they are a nomadic people, with great herds of cattle, having a republican form of government, and noted for their fine physical forms, their energy, intrepidity, daring and remorseless cruelty. In the language of Mr. New, they are "the admiration and terror of the surrounding tribes."

The missionaries heard from the native traders of Lake Baringo, which Speke puts down in his map as connected with and closely adjoining the north-east portion of the Victoria Nyanza. Mr. Stanley, as he found no such lake, nor any thing indicating it, but merely that a portion of the country adjoining the Victoria Nyanza

was called Baringo, concluded that no such lake was connected with the Victoria Nyanza. Major Burton, in a recent letter to the *Geographical Magazine*, disputes this conclusion, and insists that Mr. Stanley has "not been successful in establishing the theory that Captain Speke's Victoria Nyanza is a lake, and not a lake region;" that the Lake Baringo of the missionaries Krapf, Wakefield and New, "is not to be disposed of by the chance words of a few blacks." Now, these missionaries never claimed that the Lake Baringo, of which they had heard, had any connection with the Victoria Nyanza. On the contrary, it is laid down in New's map of 1873 as an independent lake, with an outlet running north-west in the direction of the Nile, and exactly in the same way upon Dr. Krapf's map thirteen years previously, with its position more than a degree to the east of the Victoria Nyanza. It was Speke's idea, and, as it seems, Major Burton's, that it flowed into and formed part of the Victoria, and is so represented upon Speke's map. So far from Major Burton's authorities, the missionaries, therefore, sustaining him, there is nothing in their accounts to call in question the correctness of Mr. Stanley's conclusion. It was, moreover, gratuitous and ungenerous in this eminent traveler and geographer to suggest that Mr. Stanley knew nothing evidently of Lake Baringo except what he found in Speke's map. The last time that Mr. Stanley was at my house he spent the whole evening in reading all that could be found about this region of Eastern Africa, even in so old an author as Purchas, and as Mr. New's book, the most important one, was published only three years ago, he, in all probability, has read it. Lake Baringo may possibly be connected with the large body of water which Colonel Long found in descending the Nile, although the general impression among geographers is that what he saw was not a permanent lake, but simply a temporary overflow of the river in that locality. As stated at our last meeting, my impression is, in the present state of my knowledge, that the great mountain land I have referred to, and its western and south-western slopes, is the remote and chief source of the waters which create those great reservoirs of the Nile, the Victoria and the Albert Nyanza. This was the belief of ancient geographers, and it is my conviction that they knew much more about this region than has commonly been supposed. Allowing for the general mistake which Ptolemy is known to have made in his southern latitudes, which were about eight degrees too far south, and taking his longitude as it is given in Agathodæmon's map, Ptolemy's Mountains of the Moon, as he indicated them, lay east of the Victoria Nyanza,

and south of it, exactly in the same position where the great mountain range to which I have referred extends and terminates. That these lofty and snow-covered mountains supplied the fountains which were the ultimate source of the Nile, and are also the cause of the phenomena of the annual inundation of the river in the summer throughout its whole course through Egypt, was put forth as a theory as early, at least, as the fifth century before Christ. The Nile, as it does still, swelled in the summer, and overflowed for a hundred days every part of the valley of Egypt, when it retired, and continued low throughout the winter. The Greeks, who guessed at truths which modern investigation alone has finally established, made one of those magnificent guesses as the cause of this inundation. Thales, even before the period mentioned, declared that the etesian winds were the cause of the inundation of the Nile. Anaxagoras and Democrates declared that these were northern or rather north-eastern winds which blow during winter over the valley of Egypt, without depositing upon the land of Egypt or upon the desert beyond it any part of the moisture with which they are freighted in the north. Those early geographers also in some way got the information that there was a region of snow in Ethiopia. Their theory was that these etesian or cold northern winds, which blow over Egypt in winter and spring, are condensed when they come in contact with the lofty mountain ranges of Ethiopia, and descend from the western slopes of those mountains in great torrents, which fill the great reservoirs of the Nile, and as the snows melt under the strong equatorial heat of summer, the waters of Ethiopia were by these means greatly augmented in that season of the year, and that this caused the annual swelling of the Nile. Herodotus was well informed of this theory, but he would not believe that snow-covered mountains could exist in the hot region of the torrid zone, and he therefore rejected it, like the eminent English geographer Mr. Cooley, who would not believe that the missionaries Krapf and Rebmann had seen the peaks of Kenia and Killimanjaro covered with snow until Baron Von Decken afterward not only saw the snowy peak of Killimanjaro, but also three avalanches descending its snowy sides.

Since our last meeting one of our associates, Mr. Merriam, has sent me a passage from Pausanius, which would seem to indicate that the Albert Nyanza was known in that writer's time, which was in the second century of our era. The passage is this: "Many of the Greeks or Egyptians who have penetrated into Ethiopia and to Meroe of the Ethiopians, declare that the Nile flows into a lake and *passes*



*on through and out of this*, as if it came from the dry land (or river banks), and thence running through lower Ethiopia and into Egypt empties into the sea at Pharos." It is mentioned by Mr. New that he found that the River Tana, which has its outlet in the Indian ocean, about  $2^{\circ} 8'$  south latitude, and is the principal stream of that portion of the East African coast, overflows its banks in the summer season, deluging the whole country around its mouth, while the other rivers on the same part of the coast, such as the Ozér and Sabakei, retain their natural beds, experiencing no change. This phenomenon and the direction from whence the river ran, led him to conclude that this river had its source in the snowy region of Mount Kenia, and that it was the melting of the snows there under the great equatorial heat of the summer which produced this phenomenon. If this occurs on the eastern slopes, why may it not occur on the western slopes of the mountain chain lying between the Victoria Nyanza and the Indian ocean, and be, as those ancient geographers asserted, one of the causes of the great annual overflow of water at the fountain-head of the Nile, and the cause of the phenomena of its inundation in summer along the whole Egyptian valley. Mr. Stanley has found the remote southern source of the Victoria Nyanza to be the River Luamberri, which rises in an elevated table-land about  $36^{\circ}$  longitude,  $5^{\circ}$  south latitude, about the place where Ptolemy places the ending of the Mountains of the Moon. This river, much of which, in its crooked course, was seen by Mr. Stanley, he estimated to be about 370 miles in length. Uniting with another stream, as it approaches the Victoria Nyanza, it forms the Shimeeyu, which latter river is afterward augmented by the Duma, and becomes the largest affluent of the Victoria Nyanza.

If, as I apprehend, and as most geographers believe, the Albert Nyanza shall prove to be an independent lake, then Mr. Stanley will, in all probability, be the final discoverer of the ultimate source of the Nile, and have his name forever associated with the settlement of a question that has agitated the world for more than 2,000 years.

Chief Justice Daly concluded as follows: I cannot close without a comment on the remarkable achievement of Mr. Stanley in marching through an unknown country over 700 miles in 100 days, which would have occupied the ordinary Arab traders about nine months, and, according to the usual experience of African explorers, it might have taken two years. That he accomplished this feat under the severe trial of the loss of half his command by disease and the attacks of hostile savages is an achievement that will compare with

any thing in the history of exploration; and it is also specially worthy of notice that the expedition he so successfully carried through was not undertaken by a government or by a society, but was conceived, and the heavy expense of it borne, by the proprietors of the New York Herald and the London Telegraph. It is not only an event, but an era in journalism; for by the results obtained it has placed the whole world under obligation to the proprietors of these two great newspapers.

### BAYARD TAYLOR'S SPEECH.

Mr. Bayard Taylor, being called for, spoke as follows:

MR. PRESIDENT OF THE GEOGRAPHICAL SOCIETY, LADIES AND GENTLEMEN. — It gives me very great pleasure to be present on this occasion and to take a brief part in the proceedings. I have never been an explorer in any important sense of the word, and I have long since ceased to be even what is called a traveler; but I have never lost the keenest possible interest in geographical research, especially now, when every year brings us such rich returns. I think it most fitting that Mr. Stanley's recent achievements should be especially considered by the American Geographical Society. Our recognition and encouragement are none the less due since, in all probability, the report of them will not reach him before his heroic labors are over.

In regard to the main geographical problem as affected by his latest discoveries, it seems to me that there is no need of any further discussion. For my own part, I have never held any other view than that the sources of the Nile would be ultimately found among the high mountains in Eastern Africa, south of the equator. I must confess the grounds of my belief were not at all scientific, and I am quite ready to accept whatever ridicule may follow the suppression of them.

In the first place, I have always had the greatest faith in the correctness of ancient records. I believed in the trustworthiness of Herodotus, Strabo and Ptolemy, and placed the most implicit faith in all their statements, and when in the year 1849 or 1850 Krapf and Rebmann's discovery of the great snow mountains of Killmanjaro was made known to the world I had connected it in my imagination with the course of the White Nile as given in Werne's works, which had been published by the great German some years before. The lakes of Ptolemy were still an unknown region, covering eight degrees of latitude, intervening between the snows of Killmanjaro and the furthest point which had then been reached on the White

Nile. This connection was an illogical one, if you please, but I have never been able since to separate them. Early in 1851 Dr. Knoblecher, Catholic bishop apostolic for Central Africa, published in Germany his account of the ascent of the White Nile in latitude eight degrees north. His descriptions were so careful and evidently so correct, and they revealed such an unexpected and wide field of African travel, that when I found myself in Egypt before the close of the same year I determined to devote the whole of the winter to reaching as far a point on the White Nile as was possible with my limited means. I had made no preparation in any sense for an actual journey of exploration. Indeed, I was ready to turn back at any point whenever the difficulties of travel should become too great. But though the difficulties of travel increased, we ascended the Bahr-et-Shazal and reached the town of Khartoum, at the junction of the Blue and the White Nile, where I met and made the acquaintance of Dr. Knoblecher, two years before he died. I finally found myself floating along the White Nile, carried along by a strong wind, southward, at the rate of 100 miles a day. At that time this whole region was unknown. Burton, Grant, Speke and Baker were then unknown to the world, and there was so little knowledge of the region of Egypt that my own attempt was looked upon there as something exceedingly rash and dangerous. One day while I was drifting along the current of that magnificent flood, with a curious baby hippopotamus following the boat, as if trying to find out who and what we were, I reflected as I looked down upon the water, "These waves were a short time ago snows upon the peak of Kiligaro." I had no more doubt in it than if I had seen with my own eyes the little rills trickling through the cold ravines and gathering into the river below. Then and there I wrote a poetical address to that grand mysterious mountain, and I will take the liberty of reading to you the opening lines:

Hail, thou monarch of African mountains,  
 Remote, inaccessible, silent and lone,  
 Who from the heart of the tropical fervor  
 Lifest to heaven thine alien snows;  
 Feeding forever the fountains that make thee  
 Father of Nile and Creator of Egypt.

(Applause.)

Of course there was not the slightest particle of scientific deduction in all this; there was no logic; probably no common sense. It was simply that imagination which takes the form of faith and which firmly believes what it cannot prove. Having thus committed

myself, of course I have never allowed any later deduction to shake my position — (laughter) — and I am rather afraid that now at this time I rejoice more heartily over the final confirmation for the sake of poetry than I do for the sake of geography. Between four and five years after that, Speke and Baker discovered the lost lake of Ptolemy, and I am now entirely satisfied that Stanley has at last discovered the final concluding link and has connected the waters of Victoria Nyanza with the snow on the Mountains of the Moon. I think the stream which Stanley discovered flows into the Victoria Nyanza, and may possibly be the feeder of the lake. But I think we shall discover that the greater portion of the water is derived from those marshy lowlands on the east which must receive almost the entire drainage of the western slopes of the mountains.

As I said, I had the good fortune to make the acquaintance of Knoblecher himself, who told me that he had been 13,000 feet above the sea, where they had been almost frozen to death under the Equator. From his description, as well as from other sources, I feel satisfied that this great mountain range contains at least four peaks above the snow, from 18,000 to 22,000 feet in height, at a distance of 150 to 200 miles from the Victoria Nyanza. Further explorations are necessary to make this a geographical certainty. I really need no further proof. Stanley's account of the eastern shore in his letters is quite sufficient for any imagination. I am entirely satisfied that he has discovered the true source of the Nile. The speaker added that when Stanley's first letters were published, and there was so much skepticism in regard to them, he was convinced of their truth from the fact that he spelled so many of his Arabic words improperly. He had evidently spelled them according to their sound, proving conclusively to the speaker that Stanley had caught them from the lips of the natives, and not always correctly. An imposter would never make such a mistake as that.

A letter from Paul du Chaillu was read, in which he expressed his regrets at not being able to be present, and also a glowing tribute to the genius and indomitable enterprise and perseverance of Stanley.

A series of maps, from the time of Ptolemy down to the present day, were then exhibited, and Dr. Wallis made a few remarks, when the meeting adjourned.

## SIR HENRY RAWLINSON ON MODERN EXPLORATION IN EQUATORIAL AFRICA.

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[From the London Telegraph, November 16.]

The forty-sixth session of the Royal Geographical Society was opened last night in the theatre of the London University, when Major-General Sir H. C. Rawlinson, president, delivered a highly elaborate and important address.

The president observed that the forty-sixth session opened under very favorable auspices, the list of new fellows and candidates being the largest the Society had ever known. During the last twenty years the number of fellows had risen from 1,000 to 3,000. Nor had there been any diminution of its influence and reputation. During the past year the Society had made itself felt in various ways. They had the proud satisfaction of knowing that it was owing to their persistent and well argued advocacy that the government became convinced of the desirability of sending forth an Arctic expedition — a conviction which the prime minister first communicated to the public through the president of the Society. On another recent occasion they succeeded in persuading the government, at the last moment, to send a commissioner to the Geographical Exhibition at Paris, an evil of some magnitude being thus avoided for there can be no doubt that England would have suffered both in reputation and material interests if, of all the powers of Europe, it alone had been unrepresented at this great international gathering. This congress was attended by all the most eminent travelers and geographers of the age, and numerous questions of high scientific interest and importance were discussed at its sittings, the presidents of the several geographical societies of Europe taking the chair at the general meetings, according to the seniority of their respective countries. It was found that the London society was thus only third upon the list, the Berlin and Paris societies being both earlier institutions; but it was universally admitted that in regard to numbers, wealth and influence, and especially as the patrons of discovery and the guardians of the best interests of geography, it was at the head of this department of science. The

president next glanced at the proceedings of the geographical section of the British Association at Bristol, particularizing: 1. Dr. Nachtigal's account of his memorable journey from Lake Chad, through Baghirmi, Waday and Darfur, to the Nile. 2. Colonel Playfair's report on the Aurés mountains in Algeria. 3. Colonel Gordon's narrative of his journeys in Turkistan and across the Pamir Steppes in connection with Sir Douglas Forsyth's mission to Kashgar. 4. Colonel Yule's notice of trade routes to south-western China, of special importance in the present state of the Burman Chinese question, and others of hardly inferior interest. Coming to matters of general geographical interest which have taken place during the recess, Sir Henry Rawlinson continued as follows: Equatorial Africa, to which the attention of geographers for so long a period has been prominently directed, again comes to the front as the scene of the most interesting and important exploration of the year. In my anniversary address of last May, I ventured to anticipate, from Mr. Stanley's well known intrepidity and determination, that being once launched into the interior of Africa, with means and appliances of the most extensive and efficient character, it would not be long before he had resolved the doubts which have existed since the first discovery of the Victoria Nyanza as to the true nature of that great Nile reservoir — that is, as to whether it was one large sea studded with islands, as maintained by the first discoverers, Captain Speke and Colonel Grant, or whether it was a mere collection of lagoons, as suggested by Captain Burton and Dr. Livingstone, on the strength of native information. This anticipation has now been realized, and I am enabled, through the kindness of the proprietors of the Daily Telegraph and New York Herald, to exhibit to this evening's meeting a complete chart of the lake, as delineated by Mr. Stanley, who for the first time has almost circumnavigated its shores. (Cheers.) The narrative of Mr. Stanley's cruise round the northern and western shores of the lake, which was intrusted to M. Linant de Bellefonds, whom he met at Mtesa's capital on a mission from Colonel Gordon, has been published in the columns of the Daily Telegraph only this morning. The other letters, however, despatched via Zanzibar, and published some weeks ago, have acquainted us with all the main features of this most remarkable journey, which I proceed accordingly to recapitulate. Mr. Stanley, it appears, did not follow the high road from the coast to Unyanyembe, but struck a track further to the east, probably the same by which Mtesa's messengers had previously traveled from Uganda to Zanzibar, and thus reached in 103 days,

including halts, the southern shore of the lake, distance 730 miles from Bagamoyo, having fought a severe battle with the natives on the way, and having also discovered and followed to the lake a new river, the Shimeeyu, which rises some 300 miles beyond the Victoria Nyanza, and is thus, as far as our present information extends, the true southern source of the White Nile. Embarking at a short distance to the east of the Jordan's Nullah of Speke in a portable boat, called the *Lady Alice*, which accompanied the expedition from England, Mr. Stanley, with a portion of his followers, succeeded in tracing the sinuous shores of the lake along its southern, eastern and northern sides to Mtesa's capital at Uganda. His description of this very considerable extent of new country — for we knew nothing of it before except from native information — is full of interest to the geographer and would have entitled Mr. Stanley to a very high place among African discoverers if his explorations had been confined to this single voyage. From Mtesa's capital at Uganda, Mr. Stanley followed the western shores of the lake to the River Kagera, the Kitangule of Speke, and then seems to have struck across direct to his station on the shore of Usukuma, leaving the south-western corner of the sea for subsequent explorations. His circumnavigation of the Victoria Nyanza covered about 1,000 miles, and seems to have been verified throughout by a careful series of observations for latitude and longitude. Pending the examination of the register of these observations, we cannot affirm that the positions as laid down on the map, and which differ slightly from Speke's positions, are rigidly correct; but, for all practical purposes, Stanley's delineation of the lake may be accepted as sufficiently accurate and as a great boon to African geography. With regard also to his hypsometrical observations it is interesting to note that, whereas there was a difference of more than 400 feet in Speke's calculations of height for the northern and southern portions of the lake respectively — a difference which first led geographers to suspect that the lake might be composed of separate basins of varying elevation — Mr. Stanley's measurement by boiling water at his station east of Jordan's Nullah gave a result within seventy feet of Speke's observation near the same spot; so that the height of the Victoria Nyanza may now be considered to be determined at about 3,800 feet above the sea. Mr. Stanley intended, after completing his survey of the Victoria Nyanza, to cross the intervening country to the Albert Nyanza, where he hoped, by means of the *Lady Alice*, to make a second voyage of discovery round this hitherto almost unvisited lake; but more recent intelligence from the

Upper Nile leads us to expect that he will have been anticipated in this second achievement by Colonel Gordon or by some officers of the Upper Nile command, as it appears that a steamer has at length forced its way to a point above the principal rapids, from whence the passage to the Albert Nyanza is tolerably free from impediment.

This important news is contained in telegrams of two different dates in August, sent by Colonel Gordon to General Stone, chief of the general staff at Cairo, and as an inaccurate *resume* of their contents only has yet been published in England, I am glad on the present occasion to have the opportunity of reading to you the text of the documents, from copies which have been sent to me from Egypt by Sir Bartle Frere :

### 1. TELEGRAM OF AUGUST 14, 1875.

The Arabic text of the telegram is very confused, but the contents appear to me to be as follows: We are arrived near to Appudo. They tell us that the river is navigable from here to the mouth of the Asua. In ascending the river from Kerrie to this place we have passed two rapids. The steamer Khedive has succeeded in passing the rapids of Beddin and in reaching Kerrie. This vessel will soon arrive here — that is, at Appudo. The force of the current here is very great.

### 2. TELEGRAM OF AUGUST 20, 1875.

At this date we are in the province of Appudo, with officers and soldiers of Makedi. Some soldiers from the south have unexpectedly arrived, and have been added to those coming from the north. The Governor of Fatiko has written me a letter, in which he informs me that Kabarega has been intriguing among the Dongolawa irregulars, and inciting them to evil actions. M. Linant has arrived with his soldiers in good health. The governor promises to write the necessary letters. M. Linant had met with Mr. Stanley at Mtesa's capital. Mr. Stanley stated that Lake Victoria Nyanza is very large, and contains many islands. He had navigated the lake from south to north, being quite alone, *i. e.*, without being accompanied by any European. Lieutenant Cameron was eight months previously on the banks of Lake Tanganyika, and desired to proceed towards the west. M. Linant had a fight on the road between Mtesa's capital and Kilwara, with Kabarega's people, near the place where Colonel Long had his battle. Mr. Stanley, having already seen the country on the east of Lake Victoria, desires now to pursue his explorations to the west. Communication between Ugandi, Mtesa's country, and Zanzibar, which had been open, is now impossible, owing to the hostility of the Karagwe tribes.

### EXPLANATION.

These brief telegrams are not very clear of themselves, as telegrams rarely are, but, read by the light of Colonel Gordon's letters, written during the months of May and June (and which have been published in Paris), supplemented by Lieutenant Chippendall's report of his exploration up the Nile, which was read at the Bristol meeting, they



become sufficiently intelligible. Colonel Gordon appears during the summer to have forced his way in Nile boats, or nuggurs, from Ragiaf to the mouth of the Asua, the difference of level between these points being over 300 feet. He established stations as he went on at Biddin, at Kerrie and at Appudo. He was at the latter place, 140 miles from the Albert Nyanza, at the end of August, and was preparing to try the ascent of the rapids at Makedo, eight miles in advance, and where he had already established a station. The pacha's steamer Khedive, in the meantime, taking advantage of the rise in the river, had followed in the same course, forcing her way up the rapids at Biddin and Kerrie, and having nearly reached Appudo by the last accounts. The great trial will be the passage of the steamer from Appudo to Makedo, where there are eight miles of continued rapids and cataracts. Baker estimates one single fall at forty feet. If the steamer, with the help of tow-ropes, can reach Makedo, the further navigation of the lake, a distance of 130 miles, is without obstacle. While Gordon was occupied with this ascent of the rapids, his assistant, Chippendall, had pushed on seventy miles beyond Appudo, toward the lake, and had conciliated the tribes of the neighborhood, but had not succeeded in reaching the lake itself. Both he and Colonel Gordon report, from native information, that the Nile leaves the Albert Nyanza by two channels, but where the western stream rejoins the main river is still doubtful. Colonel Gordon is further inclined to give to the Albert Nyanza a general direction of east and west, rather than north and south. He would assign the greatest width of the lake to the latitude of Magungo, where Baker left it, and where a station is now to be established; and he doubts whether the water of this great basin stretches further south than the Equator. The news of Lieutenant Cameron here given in Colonel Gordon's telegrams is, no doubt, of somewhat older date than stated, and was probably brought to Mtesa's capital by Arab traders from Unyanyembe. We know from Zanzibar that our envoy finally left Ujiji for the west at the end of May, 1874. Since this date no news of him whatever has been received at Zanzibar, although the direct route to Ujiji is more open than it has been for years past.

News of somewhat later date than these telegrams has since been received to the effect that M. Linant, the bearer of Stanley's important letter, had been killed, with thirty-six of his followers, in an attack by the Bari tribe, when near Colonel Gordon's station. This lamentable event may possibly retard the execution of this officer's plans. Sir Bartle Frere informs me in a letter just received that his

Excellency Nubar Pacha told him another telegram had been received which confirmed the report of young Linant's death and of Gordon's having been obliged in consequence to give up for the time his visit to the Albert Nyanza, in order to go and punish the tribe who had attacked the party. This is the second son that the venerable Linant Bey (the great irrigational engineer of Mehemet Ali and Ibrahim Pacha) has lost in that country. With regard to Colonel Gordon's expedition, Sir Bartle writes: "Everyone speaks most highly of Gordon and his doings—the khedive and his prime minister, as well as the English residents and American missionaries. He has not only, so they all say, really checked the slave trade and still more the slave hunting, but he has made his expedition almost pay itself by economy and by judicious management of the conquered districts."

#### THE ENTERPRISE OF THE PRESS.

Before I close this brief account of Mr. Stanley's exploration of the Victoria Nyanza—an exploration which does infinite credit to his energy and skill, and which will be explained to you in more detail by the veteran traveler, Colonel Grant, at our next meeting—I am desirous of drawing attention to the extraordinary munificence of the proprietors of the New York Herald and the London Telegraph in fitting out this expedition entirely at their own expense. (Cheers.) Such munificence far transcends the efforts of private individuals in the cause of science, and even puts to shame our public institutions, enabling, as it did, the undaunted Mr. Stanley to take the field with four Europeans and 300 natives, amply provided with arms, instruments and supplies, and assured of continued support until he had fairly accomplished his work. And I may add, that the courtesy which has placed at my disposal Mr. Stanley's map of the Victoria Nyanza for the gratification of the fellows of the Geographical Society, and for the general instruction of the public, is a graceful sequel to the liberality of Mr. Stanley's English and American patrons in preparing the original expedition. I feel assured, then, that I only express the feelings of the fellows of the Society in recording our warmest thanks to the proprietors and staff of the New York Herald and Daily Telegraph for the service they have rendered to the cause of geography, and in wishing the most complete success to Mr. Stanley's further operations. (Loud applause.)

# STANLEY'S VERIFICATION OF SPEKE'S DISCOVERIES.

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An Address by Lieut.-Col. GRANT,  
At the Meeting of the Royal Geographical Society, November 29, 1875.

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The story of the work of the American commander of the New York Herald and London Telegraph expedition, coming from the lips of Col. Grant, possesses extreme interest for the world at large.

## LIEUT.-COL. GRANT'S ADDRESS.

The journey recently made by Mr. H. M. Stanley, the commissioner of the New York Herald and London Telegraph, is one of the most important and brilliant that has ever been made in Central Africa, or indeed in any other country. For when we consider that he accomplished it so quickly, taking only about fifteen months from the time he left England, it seems at first as incredible as was his famous discovery of the late Dr. Livingstone. It is not alone the short time, but the great geographical question which he has finally settled — namely, he has confirmed Speke's discovery, that the Victoria Nyanza was one vast inland fresh-water lake; he has navigated its shores for a thousand miles, thereby proving that its waters are continuous.

## OPINIONS OF THE ANCIENT GEOGRAPHERS.

Before remarking upon Mr. Stanley's two letters, dated the first of March and fifteenth of May last, I may allude to the knowledge he had of the great lake previous to the time when Mr. Stanley visited it. The lakes of Central Africa were known to geographers as far back as the year 833, for in "Tabula Alinamuniana" of this date, also in Abul Hassan's map of 1008, we have the Nile rising from one Lake "Lacus Kura Kavar;" and in the latter map we have mention of M. Komr (Mountains of the Moon) at latitude seven degrees south. Several old maps, showing the lakes with their effluents, have been referred to in Lelewel's "Géographie du Moyen Age" thus and may be classed as follows:

1154, Tabula Rotunda Rogeriana; 1274, Ib'n Said; 1331, Ismael Ab'ulfeda — have three lakes and three rivers. 1274, Ib'n Said,

has one lake and three rivers. 1311, Bernardi Sylvani; 1501-1504, Charta Marina Portugalensis; 1507, Iohannes Ruysch — have two lakes and one river. 1529, Diego Rib'ero; 1540, P. Apianus; R. Gemma; Frisius — have three lakes and one river.

Other more modern maps might be quoted, but during the last century map-makers seem to have left out all the lakes of Central Africa, and it is only in the last fifteen years that the center of Africa has again been studded with its lakes.

#### BURTON AND SPEKE'S EXPLORATIONS.

In the year 1857 the London Geographical Society sent Captains Burton and Speke, both officers of our Indian army, to explore Africa from Zanzibar via Lake Niyassa, to Egypt. Thus it was that we first heard of lakes Tanganyika and Victoria. Captain Speke, in 1858, went twenty marches north of Kazch alone, with seventeen (?) natives, to test the Arab rumor that a great ocean, which they called a bahr, or sea, existed. He found that the Arabs had informed him correctly; a lake of almost unbounded extent stretched away from him to the north; there was, he was told, as great breadth of it on his left hand as there was on his right. He returned to England and presented his map of the discovery of the Victoria Nyanza to this Society, accompanying it with his belief that the waters he had seen were those of the Nile — but this had yet to be proved. The president for the time was Sir Roderick Murchison, who at once grasped the subject, and said, "Speke, we must send you back again."

#### GRANT AND SPEKE SET OUT.

Many months of preparation for his next expedition passed slowly to Speke, but at length, in 1860, he and I started from Zanzibar with 200 followers. It will give some idea of the fickle African when I tell you that we had only forty men of the 200 when we reached Kazch, 430 miles west of the sea-coast. Three-fourths had deserted us. We need not, therefore, be alarmed by the report of Mr. Stanley that one-half his men were non-effective. He will enlist others, or do with fewer. Months of weary delay again took place on the way between Kazch and the hilly region of Karagweh, on account of the difficulties thrown in the way by the inhabitants. We wished to get on quickly, and tried to march near the lake, but were told that the ordinary route via Usui must be kept. We accordingly went that way, and crossed the watershed at two and a-half degrees south latitude. From this position we descended the northern incline of

Equatorial Africa, and never left Nile-land till we reached the Mediterranean.

#### AFTER CROSSING THE WATERSHED.

After leaving Karagweh, the country bounding the lake on the west and north to Uganda, its capital, may be generally described as a plain of 4,000 feet in altitude, but worn away at intervals from one to ten miles with narrow excavations made by streams falling into the lake. The route may be likened to the teeth of a saw, the points being plains and the depressions swamps. We had extensive views of the lake from these plains; seeing its bays and islands, but no peaks, nor distant ridges, nor mountain cones to the east, nothing but a clear sea-horizon was visible, and no native could tell who lived beyond this sea.

#### BAYS, INLETS AND ISLANDS.

The bays and long inlets of water or friths seen by us on the western and northern shores, were M'werooka, Katonga, Murchison, etc. Some were completely landlocked and twenty miles in length. I allude to the one seen near our camp at Uganda capital. It is here, probably, that Colonel Long of the khedive's service, found himself the other day, when he reported that Speke's Victoria Nyanza was merely a small affair of thirty miles in extent. What a prize he had at his feet!

The largest island I observed was that of Sesseh, at the north-western corner of the lake; by compass bearing it was forty miles long; the width could not be taken with any accuracy from the shore, but it appeared only three or four miles. It has no hills, is low in the water, and at one point I observed its shore to be within a mile of the mainland. The king of Uganda keeps his fleet of canoes here, and consults with the god of the lake, who resides on this island.

#### SIR SAMUEL BAKER'S MISTAKE.

It was mentioned last season, at one of our meetings here, by Sir Samuel Baker, that he was given to understand that the native name for the lake was Sesseh. Petermann, in a comprehensive map published this autumn, has followed this mistake by calling the lake Sessi See, as well as Ukerewe, and Victoria Nyanza. I explained that Sesseh was a large island, and am glad to have my statement confirmed by Mr. Stanley, who has found it to be the largest island on the lake. Various and numerous were the other islands seen by us, but they were nearly all uninhabited and of no importance.

## THE KITANGULE KAGEERA RIVER.

The greatest river on the route between the most southern point of the lake, round its western and northern shores, is the Kitangule Kageera, in the district of Karagweh. It rises probably from the foot of the conical mountain of M'f'oombiro, supposed by us to be 10,000 feet high. Numerous lakes and valleys send their waters to it. In appearance it has a slow, majestic winding course, which is navigable for thirty to forty miles from its mouth. Vessels drawing twenty five feet of water could, I believe, float at the ferry where we crossed. Speke and I had to conjecture this depth at the ferry, because we were forcibly prevented from dropping our lead-lines into it; the king would not be pleased; it was not "canny" to take soundings. I should not be the least surprised to hear that Mr. Stanley selects this noble river as a point for exploration. With the Lady Alice he can ascend this stream from the lake up almost to King Rumanika's door, or he can cross over the mountains of Ruanda and Urundi, and descend to the spot on Lake Tanganyika where Livingstone and he had such a pleasant picnic; or he may select the Albert Nyanza as his field for exploration. All will be new to us; either route would interest geographers intensely, for the country, its people and its animals are all unknown.

## FIVE AND TWENTY STREAMS.

Leaving the River Kitangule and proceeding north to the capital of Uganda, a distance of 125 geographical miles, we counted five and twenty streams, varying in depth from three to ten feet, which we waded, swam or crossed by bridge. There were numerous other smaller ones, which would not give trouble even when flooded. They were mud colored and mud sided—swamp rivers in fact.

## THE AREA OF THE LAKE,

according to Speke, who took latitudes and longitudes for its western half and only had native information for the other half, is 645 geographical miles in circumference, and if we add to this the circumference of Lake Bahr-ingo we have 910 geographical miles. Speke, therefore, after his last journey in 1860–63, made the Victoria Nyanza out to be of an area not equal to Lake Superior, which is 1,500 miles in circumference, but parallel in size with Huron (600), and Erie (650), nearly doubling the size of Michigan and Ontario, which are 550 and 500 miles in circumference.

## THE EXIT OF WATER.

The only point where water was observed to leave the lake was at Ripon falls, in Uganda. Here the body of water is 300 yards wide — the depth was not calculated — but this quantity bears but a small proportion to the contents of the lake. As to the depth of the lake I am inclined to the belief that Stanley's measurement will show it is a comparatively shallow body of water resting on a vast plateau ; that there is no chasm such as Tanganyika is formed of. The Nile, after leaving the lake at Ripon falls, has a navigable course to the Karuma falls. From here to the Albert Nyanza its course is through rock and over high falls. We have yet to learn the exact position of the river as it leaves the Albert ; but it is again navigable from this to Dufli, the village near M. Miani's tree ; hence it again foams over rocks for some distance, and at intervals, as it runs below and north of the Jubl Kookoo mountain. Colonel Gordon has, however, found it navigable farther up from Gondokoro than was suspected — namely, up to twelve miles south of Rujaff, whence, all the way to Egypt — during high Nile — for miles there is no obstruction to a boat drawing five or six feet of water.

## COMING HONOR TO STANLEY.

Many will remember the enthusiastic reception given in old Burlington house, where Speke and I were received after telegraphing that the "Nile was settled ;" that "the Victoria Nyanza was the source of the Nile." Such a reception certainly awaits Mr. Stanley when he appears here, and if he should make more discoveries — which he undoubtedly will if God spares him — there is no honor which this Society can bestow that he will not have earned over and over again. He, as an observer, a traveler in its real sense, a provider of true and pleasant pictures from unknown lands, has confirmed the discoveries made by Speke, and to him the merit is due of having sailed on the broad waters of the lake, and sent home a map and description so vivid and truthful that the most skeptical cannot fail to be satisfied.

## SPEKE'S WORK AND FAME.

Here it may be as well to explain that some geographers never accepted Speke's lake as one great ocean, although the geographical world did. The foremost of unbelievers, and the one who appeared first in the field, was Captain Burton, the companion, at one time, of Speke. He did not seem to have any reason for his argument. He said there must be several lakes, lagoons ; any thing, in fact, except

the lake. Even the late Dr. Livingstone and Mr. Stanley made out there must be several lakes. Livingstone wrote in a very patronizing tone: "Poor Speke had turned his back upon the real sources of the Nile;" "his river at Ripon falls was not large enough for the Nile," and was disparaging of Speke's discoveries. The work of Dr. Schweinfurth, the "Heart of Africa," has fallen into the greatest blunder. About three years ago a map, constructed without authority in our map room, was suspended from these walls; but, on my protest, the president, Sir Henry Rawlinson, ordered that it be altered to the delineation of the lake by Speke. This was done. Numbers of other writers and map-makers, Continental and English, have gone on disintegrating the lake from book to book, map to map, and from year to year; but I think the public will now perceive how unjust the above critics have been, how firmly the fame of Speke has been established, and will not fail to accord him that place in their opinions which he may have lost for a time.

#### THE VICTORIA NIYANZA IN TWO OR MORE LAKES.

The following published maps exhibit the Victoria Nyanza, divided into two or more lakes:

"The Nile Basin," by Richard F. Burton, 1864. Coast-line delineated only at southern extremity of lake and the south side of the islands Kerewe and Mazita; from the Kitangule river to the Katonga; at Murchison creek; at Napoleon channel. Between these are placed the words "Supposed site of Victoria Nyanza." Bahari 'Ngo made a distinct lake.

"Lake Region of Eastern Africa," by A. Keith Johnston, second edition, 1872. Victoria Nyanza, a continuous coast-line from Napoleon channel, along north and west sides to Urundi, on east coast; colored only as water at the south extremity and around the islands Kerewe and Mazita; from a little south of Kitangule river to a short distance east of the Katonga; about Murchison creek; about Napoleon channel. The eastern side made a distinct lake, with the name Bahari ya Ulkara. Lake Baringo entirely separated from the Victoria Nyanza.

"Dr. Livingstone's Routes," 1866 to 1872; map in "Ocean Highways," July, 1872, by A. Keith Johnston. Victoria Nyanza, a continuous coast-line as above, with the islands Kerewe and Mazita, forming a peninsula from the sea-shore; water shown only from Napoleon channel to the Kitangule river; about the southern part of



the lake and the peninsula; along the east coast with the name "Sea of Ukara." Lake Baringo quite distinct.

"How I Found Livingstone," by H. M. Stanley; map by E. Stanford, 1873; south of equator. Coast-line of Victoria Nyanza only delineated, and water colored at Jordan's Nullah, a little past Muanza, the Bengal archipelago, and south side of Kerewe and Mazita islands; from opposite Mashonde to the Equator; on east side, about Kaverond of Wakefield's map, with name "Sea of Ukara."

In the sketch map of Dr. Schweinfurth's routes, 1868-71, by E. Weller, in "The Heart of Africa," by Dr. Schweinfurth, a series of five distinct lakes, takes the place of the Victoria Nyanza. Of these lakes Ukara and Ukerewe, respectively, the east and south extremes of the Victoria are named. Lake Bhari 'Ngo is quite separate, drained by the Asua, receiving at the north the waters of Lake Kamburu, by a river from its south extremity, which last receives the waters of another lake, not named.

"Süd Afrika und Madagaskar," by Dr. Petermann; forty-five degrees of Stieler's Hand Atlas, 1872. In this "Ukerewe" (Victoria Nyanza), 4,308 feet (?), is delineated by Speke, except that there is no east coast marked.

In Col. Long's manuscript map of his visit to Mtesa and the Victoria Nyanza, the lake is shown to have a width of only twenty miles from the north coast.

#### STANLEY'S JOURNEY AND WORK.

It is now my place to make some comments on Mr. Stanley's journey.

Starting from Zanzibar in the month of November, 1873, with 300 followers, he made a rapid journey of 720 miles to the south-east corner of Victoria Nyanza, performing this distance in 103 days, inclusive of halts. Through forests, across deserts and rivers, he conveyed the boat *Lady Alice* in sections and launched her on the lake. The forethought and energy required to convey this boat must command the fullest admiration, for in doing so he has navigated the inland ocean, and given us a thrilling account of its extent, its rivers and shores and its beautiful islands. He experienced almost stunning losses and privations in his land journey. Having to travel through sterile, unhealthy regions, the want of food and water was felt severely; his men suffered from sickness—death was rife among them—and he had to contend against the Waturu race, who sounded their war drums and killed twenty-one of his men. After contesting

with them for three days, and clearing a way for his advance, he continued his march toward the lake. In his latest letter, the fifteenth of May, allusion is made to a fight from his boat with the Waruma race; but as no particulars are furnished, the account may be in the correspondence sent via Uganda to Egypt. [This correspondence has reached England since the above was written.] The Island of Uvuma, at the north end of the lake, is the nearest approach to the race mentioned.

#### HIS FIRST VIEW OF THE GREAT SEA.

On the twenty-seventh of February last he obtained his first view of the great sea, and it can be imagined how impatient he must have been, and how hard he and his men must have worked to put the Lady Alice together to have a short trial on the lake before taking to sea in her. There are many questions which we should like to ask Mr. Stanley here — namely, what crew had he? who were they? how did they all manage for food? and was it ever rough weather? But we must be content with his map now before us, with its rivers, islands and broad expanse.

#### OF THE RIVERS

which he observed during his voyage round by south, east, north and west coasts, he gives, commencing with the most southern and proceeding northwards, the Monunguh, Luamberri and Duma. These three join and form the Shimeeyu. The Ruana falls into Speke gulf, and is made ninety miles in length. Fifty miles farther north comes the Mara, seventy to eighty miles. Twelve miles north there is the Mari; then, in succession, the Shirati, Govi, Ugoweh and Yagama.

In all, ten rivers are in the map.

The only one described — the Leewumbu or Shimeeyu — seems to be the only important river. It rises in 5° south latitude and 35° east longitude, runs a course of 170 miles, where it and two others join to form the Shimeeyu, which extends for 100 miles farther. The width of the Leewumbu in the dry season is twenty feet, and depth two feet. Mr. Stanley gives great importance to the Shimeeyu, saying its course is roughly 350 miles. But the river Ugoweh, at the north-east corner of the lake, must be a considerable stream, also, for hippopotami were seen in it. No remarks are made on the other streams.

We, therefore, have but one great stream on the whole length of

the eastern shore of the great lake, and we know that on the western shore there is the same coincidence, namely, the Kitangule-Kageera, the only river which we crossed in a canoe. The river Katonga we heard much spoken of, but I do not think it can be navigable from the bay.

#### THE GREAT PLAINS.

It seems as if the great brown plains which Mr. Stanley speaks of as bounding the lake to the east drink up all the rain that falls upon them. Everywhere he heard of plains to the east; even the "towering" table-mountain of Majita or Mazita, east of Ukerewe island, was seen to be surrounded by plains; also each of the island-like mountains of Ururi, Urambi and Shashi, had their plains; but all these being within a radius of forty miles (*vide* map), I take it they are the remains of an old plateau, being 3,000 feet above the level of the lake. There is a similar table-mountain at Cheysimbee, on the opposite coast.

#### GIGANTIC MOUNTAINS.

The mountains of Ugeyeya are called "gigantic," for Mr. Stanley says: "We pass between the island of Ugingo and the gigantic mountains of Ugeyeya, at whose base the Lady Alice seems to crawl like a tiny insect, while we on board admire the stupendous summits." There is nothing as to size or summit on the other side of the lake to compare with this description of the equatorial mountains of Ugeyeya. This seems to be rather a mountain region, for to the east of the "Bridge" or Basalt Isles a "flat and slightly wooded district, varied at intervals by isolated cones" was visible from the summit of the isle. Manyara, at the north-east angle of the lake, on the eastern side of the bay, is "a land of bold hills and ridges, while the very north-eastern end, through which issues the Yagama river into the Nyanza, is flat." Having extracted all the notes on the mountains of the east coast, we can say that there are no mountains, no volcanic cones, to be compared with them as to their height and proximity to the lake on the west coast, where the whole country is flat from Kitangule north, and the streams run to the lake like hare soup down a tilted plate, leaving deep furrows in the plain. We saw several long valleys, which, no doubt, once were "friths," in the Victoria Nyanza. They are silted up. Thousands of acres of land on the west coast are in this state. I, therefore, cannot but conclude that the fairway of the lake will be found on the east coast, and that the miles of swamps and shallow water in the west do not exist to the same extent on the other shore.

But this interesting question will, I trust, soon be settled when we receive Mr. Stanley's observations on depths.

#### SIXTY ISLANDS.

No fewer than sixty islands may be counted upon Mr. Stanley's map, dotted generally in clusters all around the shores, at distances of two and three miles from the mainland. The largest in the whole lake is Sesseh, which we made forty miles in length. Mr. Stanley makes it  $35 \times 25$ . Passing to the south of the Kitangule, we have Bumbireh,  $30 \times 10$ ; and following the curves of the lake, Ukerewe,  $32 \times 7$ ; Ugingo,  $20 \times 5$ ; Usuguru,  $25 \times 5$ ; and Uvuma,  $15 \times 10$ . The remaining islands are small in comparison to those mentioned here, and the majority of them being near the northern shore, at the end where the waters leave for Egypt, while the others are chiefly by the shores of the southern third of the lake. If we examine the areas of the islands mentioned above, for instance Sesseh—or, as Mr. Stanley calls it, Sasse—it has an area of 1,110 English square miles; the dimensions of this one island will give some idea of the importance of this inland sea, which is probably the largest body of fresh water, at this altitude, in the known world.

#### LAKE BAHR-INGO.

Captain Speke attached the Lake Bahr-ingo to his lake at its north-east corner. Rev. T. Wakefield places it fifty miles detached from the lake, but Mr. Stanley inquired of the natives regarding it and was told there was no lake in that direction. However considering that the native information obtained by the two former gentlemen has proved to be correct in most cases, and that it was obtained independently, on this account I do not give in to the non-existence of the Bahr-ingo lake. He mentions that the River Ugoweh joins the lake here and is of considerable size. Hippopotami were seen there by him, and it may be the water-communication which Speke heard of as connecting the Bahr-ingo with the Nyanza. There is also the Yagama here. Regarding

#### THE ALTITUDES

taken by Mr. Stanley, we find that in leaving the desert plain of Ugogo, he ascended to another plateau, 3,800 feet; again, as he proceeded north-west, he came on a still higher one of 4,500 feet, and his greatest altitude was 5,100 feet which is the watershed between the lake and the sea-coast. This last height corresponds with the highest

inhabited country Speke and I traversed in our journey, viz., the capital of Karagwe, which approaches to within fifty miles of the west south-west end of the lake. The height of the Nyanza above the sea was 3,550 to 3,665 feet by one aneroid and 3,575 to 3,675 by another. A further observation by Mr. Stanley with two boiling thermometers made the altitude subject to correction, similar to Speke's, viz., 3,808, or sixty-eight feet in excess of Speke's observations. The difference is insignificant and we may accept them as the established altitude of Victoria Nyanza.

#### LONGITUDES.

Mr. Stanley found that his latitudes along the Uganda shores differed from Speke's by an average of fourteen miles. His longitudes varied little. In one instance, that of the Katonga, Stanley made it sixteen miles north latitude, while Speke's observation was a few miles south of the equator. The two observers observed differently; but this is no reason for discrepancy. Mr. Stanley took the sun at noon with a sea horizon and made an observation for longitude in the afternoon. He cannot understand how Speke, who was on shore, observed, unless it was by double altitude of the sun; but I can give the explanation.

#### SPEKE TOOK HIS LATITUDES

by observing the meridian altitude of suitable stars with an artificial horizon and generally found a star of the first magnitude for his purpose. At Katonga he had Capella and Canopus (both first magnitude). Indeed, while in Uganda, it will be seen from the following that he used no others. The observations were checked by the fact that he was traveling north at every stage; his dead reckoning would correct him. I cannot see how to account for such a blunder, for I have the fullest confidence in his observations:—January 31, 1862, at Meruka, by star (first magnitude) Capella, latitude 36' 2" S.; February 1, 1862, at Sangwa, by star (first magnitude) Capella, latitude 30' 47"; February 2, 1862, at Masaka, by star (first magnitude) Capella, latitude 20' 2"; February 6, 1862, at Kituntu, by star (first magnitude) Canopus, latitude 7' 40" S.; February 9, 1862, at Nakusi, by star (first magnitude) Capella, latitude 7' 15" N.; February 10, 1862, at Kibibi, by star (first magnitude) Capella, latitude 15'; February 12, 1862, at Nakatema, by star (first magnitude) Capella, latitude 17' 55"; February 13, 1862, at Niamagoma, by star (first magnitude) Capella, latitude 17' 15"; February 25, 1862, at Bandowaroga, by star (first magnitude) Canopus, latitude 21' 19".

Speke never rested satisfied with an indifferent observation; he repeated it by another star on the same night or following opportunity, so that he took many more observations than are recorded, and only registered those which gave him confidence.

At the stations immediately south and north of the equator, he observed as follows for longitude and variation: February 3, 1862, at Masaka, five altitudes and three compass bearings; February 4, 1862, at Masaka, three distances; February 10, 1862, at Kibibi, ten altitudes and seven distances; February 11, 1862, at Kibibi, twelve altitudes, five distances and one compass bearing.

The area of Victoria Nyanza, as made known to us by Mr. Stanley, proves that Speke far underrated its extent. I have carefully measured the maps of both travelers with compass to ascertain their existing difference, measuring every ten miles, and the result, by this rather rough means obtained, is as follows: Circumference of Speke's lake, 645 geographical miles; circumference of Stanley's lake, 890 geographical miles. If we add 265 geographical miles, the circumference of the Bahr-ingo lake, in Speke's map, we get 910 miles as one body of water — a curious similarity, in circumferency, to Stanley's single lake.

#### SPELLING THE WORD NIYANZA.

Mr. Stanley thinks the mode of spelling Nyanza is objectionable, because he says the natives do not pronounce it in this way. Let me first explain that in using the expression Lake Victoria Nyanza, we actually say Lake Victoria Lake — Nyanza signifying lake. All that is necessary, when using the word, is to call it the Victoria Nyanza, or Victoria lake. As to the spelling and pronunciation of the word, we find that it is sounded differently in different localities, and different people spell it differently. In old maps, Nianja, of three syllables; in Livingstone, N'yassa, of two syllables; 1863, Speke and Grant, N'yanza, of two syllables; 1870, Rev. T. Wakefield's Sadi, N'yanja, of two syllables; 1876, Mr. H. M. Stanley, Niyanza, or Nee-yanza, of three syllables.

Nyassa, Nyanz-a (nasal *n*), and N'yanja have a more liquid sound than the three syllable word of Nee-yanza, and we found the Waganda and Wanyoro pronounced it by the method adopted by us.

#### NAMES OF THE COUNTRIES WHICH WERE OBSERVED BY STANLEY.

Some allusion may be made to the names of the countries which were observed by Mr. Stanley on the east and north-east shores of the lake, trying, by comparing them with the routes given by the Rev. T. Wakefield, to find similarity or identification; but, after a close

examination, I have failed to dovetail the routes of the latter with Mr. Stanley's names. Sadi, Mr. Wakefield's informant, was correct in describing the extent of the lake, and conjectured that the northern stream from Lake Bahr-ingo "enters the Niyanza to the northward," but, as already stated, Mr. Stanley could get no information whatever regarding this lake.

The only names which tally are given below, and I leave it to others to make further inquiry :

Wakefield's Map.	Stanley's.	Speke's.
Ushaki .....	Shashi.....	Ushaki.
Urudi .....	Ururu .....	Urudi.
Thiri .....	Utiri .....	-----
Kavirond .....	Kavirondo .....	-----
Ukara .....	Kavi (may be Kari) .....	-----
Ligeyo.....	Ugeyeya (or Ukereweh) ..	-----
Uvuma (Mainland) .....	Uvuma (Island) .....	Uvuma.
Usoga .....	Usoga .....	Usoga.
-----	Manyara .....	Amara.

None of the above places were visited either by Sadi or Speke; they were obtained by inquiry from natives, and their positions are tolerably accurate when compared with the same places fixed, I presume, astronomically by Mr. Stanley.

#### AMERICAN ENERGY COMPLIMENTED.

In concluding these few remarks on Mr. Stanley's journey, I may state that they are made on my own authority, by request of the President of the Geographical Society, for I felt that it was not for me to come forward as the champion of Speke — he required no such bolstering, in fact I should have preferred that some other and more competent hand wrote a comment on Mr. Stanley's journey. However, I have great pleasure in complying, for it has opened up to me an old love, and given me this opportunity of congratulating the Society on the great achievement before them. Who among us would have had his energy? Who would undertake a cruise in an open boat and absent himself from his camp for fifty-eight days? Who would risk such danger to life and exposure to an African sun in the month of April? Who of us are able to guide, provide for, lead and attend to a little army successfully, and, in the midst of all this, take their observations for latitude and longitude? I think him a worthy representative of the energy which sent out such an expedition.

J. A. GRANT.

HOUSEHILL, NAIRN, N. B., *November 3, 1875.*

## DR. PETERMANN'S VIEWS OF IMPORTANT POINTS IN CENTRAL AFRICAN EXPLORATIONS.

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[Translated from Dr. Petermann's "Geographical Communication."]

VIENNA, *November 22, 1875.*

The year 1875, which has brought us so many bitter disappointments in West African expeditions, recompenses us by great success in Equatorial Africa. We can scarcely call this success unexpected, for Mr. Stanley had already proved, on the occasion of his journey in search of Livingstone, that he combined unbending resolution with great skill, and that he understood how to carry out a great plan of exploration in spite of all hindrance. As then, Stanley is supported with sufficient supplies and money; and his past experiences led us to anticipate even more favorable results than before. It created just astonishment when James Gordon Bennett sent a correspondent of his paper, the *New York Herald*, at a cost of thousands of dollars, to search for Livingstone in the interior of Africa. "My father," said he to Stanley, "has made the *New York Herald* a great newspaper, and I hope to make it still greater. I will publish all the news that can interest the whole world, however much it may cost." One could foresee that if the plan for finding the long-lost Livingstone should prove successful, it would cause the greatest excitement, and would give the *New York Herald* much honor. Mr. Bennett's efforts were, therefore, said at first to be nothing more than speculative ones, but when Stanley was sent out last year, for the second time, at the cost of the *New York Herald* and of the *London Daily Telegraph*, accompanied by a number of European servants, well supplied with wares, arms, astronomical and other scientific instruments, the use of which he had learned and practiced, and especially with a large and portable yacht, capable of being taken to pieces, for the purpose of sailing on and exploring the Central African lakes, and to complete the explorations of Livingstone, it was shown that the enterprise of the *New York Herald* was not based on a mere clamor after effect or a grasping at sensation, but that it had conceived the mission of a great newspaper in a magnificent and hitherto unheard of spirit, and was endeavoring to make its reportorial system one of exploration; and



certainly that new system could not have been commenced in a more auspicious manner; and through Stanley Mr. Bennett has achieved a second and more important success than the brilliant one which at first made him famous.

#### STANLEY'S GRAND EFFORT.

The writer then goes on to describe Stanley's journey until he reached the Victoria Nyanza, and says: "After a march of 103 days he stood, on the 27th of February, 1875, on the shores of the lake which Captain Speke discovered in July, 1858, and declared to be the principal lake source of the Nile." Speke endeavored, in a second journey with Grant (1859-1863), to prove the connection of this lake with the Nile, but in this he was not completely successful, and his report, therefore, found just as many opponents as adherents. His old companion in exploration, Captain Richard Burton, became particularly hostile to him, and endeavored to show that the discovery of the Victoria lake was a matter of no importance, to put in its place a group of smaller lakes, and also sought to show that the Tanganyika was the principal lake source of the Nile.

Supported by the differences in the altitudes which Speke had found at the southern and northern shores of the lake, and by the representation that there were a number of effluents on the northern side of the lake on Speke's map, Burton's views found acceptance in many quarters, and the services of Speke and Grant were almost forgotten, although Baker, in 1864, corroborated and confirmed a number of their assertions in regard to the outlet of the Victoria Nyanza. Indeed, in recent years, the representations of a group of lakes on the place of the great Victoria lake became constantly more frequent on the charts, and their right to be placed there appeared to have been corroborated in 1874 by Colonel Long, who, from the north shore of the lake, could only perceive the lake extending southward a short distance.

It was reserved for Stanley to prove the truth of Speke's views in two great points. Evidently gifted with an appreciation of geographical science, he induced Livingstone, in 1871, to explore with him the northern end of the Tanganyika, and he found, instead of the outlet which had been supposed, by Burton and many others, a compact basin, with unimportant mountain streams feeding it, just as Speke had narrated. In 1874 Lieutenant Cameron discovered that the Tanganyika had its outlet on the western side, sending its waters to the Lualaba Congo, and therefore could not belong to the system of the

Nile. The second point, the unity of the Victoria Nyanza, has now been made a certainty by Stanley's voyage round the entire lake in the months of March and May of the present year. His map, as published in the *New York Herald*, and the chart, shows a well outlined shore, with numerous groups of adjacent islands, while Speke could only show mostly undefined outlines; but both agree in the great fact, especially when we compare with Stanley's the modification of Speke's chart, necessitated by Wakefield's inquiries — especially the separation of Baringo lake from the Victoria Nyanza.

The details, where Speke himself saw the shore, agree in a satisfactory manner. Thus we see, after the lapse of a dozen years, the discoverer of the lake vindicated, his descriptions verified, and his fame purified from all suspicions of having given us pictures of his own fantasy, instead of the truth. Unfortunately he was not permitted to live to experience this satisfaction, but it is, nevertheless, a matter at which to rejoice that his companion now sees verified and acknowledged that which they achieved together through long years of labor and suffering; and every one will deeply sympathize with the words which Grant wrote to the author of these lines: "This is a glorious verification for me, after so many, like Burton, and even the great Livingstone, have refused to receive our accounts. They cut up the lake into a number, and called them lagoons; but I have never deviated from the truth, and thank God that I live to see my dear, true friend Speke vindicated by Mr. Stanley in his geography of that interesting equatorial region. Speke always gave a sober, moderate report of what he saw or heard. Exaggeration was not in his nature; facts were his motto."

The most southern, and at the same time the most important feeder of the lake, was found by Stanley to be the Shimeeyu, which is said to rise in  $5^{\circ}$  south and  $35^{\circ}$  east, in the land of Urimi, and after a course of 350 miles flows into the lake eastward of Speke's Jordan. Whether this Shimeeyu may be considered as the true source of the Nile depends on two further problems which have yet to be decided by Stanley.

Not satisfied with the exploration of the Victoria Nyanza, the young American is about to proceed to the Albert Nyanza or Mwutan to explore that lake in the Lady Alice. On the one hand, he is to examine if this lake receives tributaries which may claim precedence over the Victoria Nile or Somerset river; that is, whether it may have a greater right to be looked upon as the principal feeder of the Nile. On the other hand, he must definitively decide the connec-

tion of the Mwutan with the Nile. Speke had accepted this connection from the communications of natives and traders. Baker has, later, made this very probable, though it is not yet entirely without doubt, nor will it be until a traveler shall have seen, with his own eyes, the outlet of the lake and followed it to the known portion of the White Nile.

Like Speke, so Baker learned from the natives, especially from King Kamrasi, of Unyoro, that the Somerset river, immediately after entering the Mwutan, leaves it again and continued its course as a navigable river, between the lands Koschi and Madi. From Magungo (2°, 16' north), the point where the Somerset enters the Mwutan, Baker saw towards the north, at a distance of eighteen miles, the place where the river left the lake — the lands Madi on the east and Koschi on the west, as well as a mountain ridge accompanying the river on its left side. He could not proceed down the river because his followers feared the hostile Madi, and it appeared more important to follow that part of the Somerset river from its mouth up north to Karuma falls, which Speke had not seen. So perfectly convinced was Baker that the Nile issued from the Mwutan that he considered it superfluous to verify this assumption. When, later, on his return journey, he came to the Nile near Ibrahimija, in the land of the Madi (3°, 34' north), he ascended an elevation and saw the course of the river for about twenty miles back, and here again lay in the east the land of the Madi, in the west Koschi and the chain of hills bounding the valley of the river in the west. Magungo and Ibrahimija lie about ninety English miles apart. From these two points Baker saw about thirty-eight miles. There is, therefore, a gap of about fifty miles, and if Baker really saw the outlet of the Mwutan, its identity with the Nile is as good as proved. But there is just a possibility that he may have been mistaken, and that the assertions of the natives are incorrect. With the same confidence he had asserted, on the basis of what he was told by the natives, the connection of the Tanganyika with the Mwutan, which is now decided to be erroneous.

#### WHAT THE ANCIENT SAVANS THOUGHT.

Apart from the earlier views of Peney, De Bono and others that the Nile arose from numerous small tributaries, and not issuing from a lake, Speke was struck with the fact that the Nile in Madi was of much less volume than Somerset river. He called it a "highland stream," and his drawing gives a very small opinion of the volume of water in the young Nile, and contrasts remarkably with the assertion

of Col. Long that the Somerset was navigable for the Great Eastern ; therefore, for the greatest ship of the world. E. Marno, in one of his latest letters, also says that the size of the Bahr Djebel (the Nile that passes Gondokoro) does not lead to the conclusion that it is the outlet of such a magnificent lake. Traders told him that the Mwutan lost itself at the northern end in swamps, and many traders assert that the outlet which Baker supposed he had seen is only a creek or bay, like Murchison creek, on the northern shore of the Victoria Nyanza. In short, there yet remain doubts which must be cleared up before the Nile problem can be definitely settled. It is always possible that the Mwutan has its outlet in the south or west, perhaps leading to the Lualaba ; that possibly the Victoria Nyanza and the Albert Nyanza, at present considered to be the lake sources of the Nile, in truth, like the Tanganyika, Bangweolo, Moero, etc., belong to the Congo system, and that the Nile springs not from lakes, but from very small tributaries which in part could come from the mountains to the west of the Mwutan.

A survey of the course of the Nile upward from Ibrahimija — an examination as to whether it really comes from the Mwutan — is now the most pressing necessity for the geography of the Nile, the key to the solving of the ancient problem ; and it is to be regretted that Col. Gordon has not long since undertaken this examination from his garrison at Ibrahimija. Twice have his messengers, with small escort, reached King Mtesa's, on the northern shore of the Victoria Nyanza, and it would be very easy for him to send a small exploring expedition up the Nile to the Mwutan. The hindrance hitherto has been the steamer built for the navigation of the Mwutan, which lay at Lado, and could not be transported beyond the cataracts ; but it would be an easy thing to examine first of all whether a steamer put together above the cataracts could really succeed in reaching the Mwutan. According to the latest information, in August, Col. Gordon had arrived with the steamer at Ibrahimija, and he will in all probability strive with Stanley to bring the Nile problem to a solution. We can therefore entertain the hope of seeing in our days the elucidation of the most celebrated of all geographical problems, one which engaged the attention of Herodotus, Cæsar and Nero, the problem of the true sources of the Nile.

## CRITICAL REVIEW OF STANLEY'S WORK.

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By Captain RICHARD F. BURTON.

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TO THE EDITOR OF THE GEOGRAPHICAL MAGAZINE — SIR: I heartily congratulate the Daily Telegraph upon the choice of its gallant commissioner, and I only hope that the latter may succeed in carrying out the grand exploration which he has so worthily begun.

Nevertheless, it is my duty to warn your readers, as I did nearly three years ago, against accepting, without the gravest consideration, the statements put forward by Mr. Henry M. Stanley in the Daily Telegraph (October 15 and 18, 1875.) The letters are evidently written in haste, and after much weariness of mind and body; and mature reflection combined with further experience, may introduce important modifications into the more permanent record of travel.

At length after ten years we are stripping the garb of fable from the Victoria Nyanza. I will not write the word Niyanza or Neeyanza, because the latter forms are hardly in accordance with the rule of the great South African families of language, and because Mr. Stanley, although strong in the vernacular, proved in his first work "How I found Livingstone," that he ignored the minutiae of the speech, and that his ear must not be relied upon. Far more competent scholars, Messrs. Wakefield and New, prefer to write the word Nyánja, even as Mr. Stanley would convert Mazita into Majita. It is the same with "Mkali" for "Mk'hali;" nor must we accept "Ituru" until we are enabled to decide whether it is the "Utaturu" of Captain Speke's first map, a name which afterward unaccountably disappeared from the charts. We must hear more before we adopt the "mangroves" twice mentioned as growing in sweet water; and, a far more important point, we can not for a moment admit the dictum, "I am sorry to say that, if I am right, Speke is about fourteen miles wrong in his latitude along the whole coast of Uganda." My late companion's observations have been carefully checked by the highest possible authority, Lieutenant Cameron, R. N., and the gallant young officer found them generally right within a mile. In the same paragraph Mr. Stanley seems not only to trust in aneroids, but also to think that the longitude is an easier matter to settle than the latitude;

while he has evidently not reflected upon the immense and variable amount of mirage and refraction which would result from using at noon the sea horizon of a "quiet lake" situated directly under the Equator.

The Victoria Nyanza, I have said, is now assuming an intelligible topographical shape. We hear nothing of the three great outlets, the Napoleon channel, the Luajerri, and the Mwerango (Merago) which for the last decade have disfigured our maps. We read for the first time of the important north-eastern influent, the Ugoweh, and of the great south-eastern feeder, the Liwumbu-Monangah-Shimiyu. These absolute gains to geography, one of them numbering 350 miles in length, are simply due to the energetic explorer. We find Mazita or Majita converted from an island to a headland by Mr. Stanley, who approached it from the east, whereas Speke's terminus, Muanza (1858), was to west; and the reader of my "Lake Regions" (vol. 2, p. 214) will remember the doubts concerning its insular nature, which the accounts of the Arabs awoke in my mind. From information I was able to state that the "Jezirah," an ambiguous term, meaning equally insula and peninsula, can scarcely be called an island; and in my map Mazita is dotted toward the mainland. We are also relieved from having to believe in a sheet of water whose level was nearly 500 feet higher in the south (3,740 feet) than in the north (3,308 feet). My friend, Captain C. George, has ably shown (*Daily Telegraph*, October 18,) the provisional value of the last measurements, and this practiced calculator states that "Mr. Stanley's result (3,808 feet) agrees so closely with Captain Speke's that it must create a favorable impression on scientific geographers."

On the other hand, we are absolutely nonplussed by the statement of the Anglo-American expedition that during fifty-eight days their brave little boat, the *Lady Alice*, "had surveyed over 1,000 miles of lake shores." And the editorial article (October 18) adds that the "sea of rhomboidal outline" measured about 230 miles long by some 180 broad. Of course these are round numbers and general assertions; but they are not the less puzzling. Mr. Stanley after leaving Kagehyi and embarking on the lake, bends for a short distance to the east and then turns directly northward; thus cutting off a huge eastern slip, at least one-third, from Captain Speke's "dodo-like" form. In this matter his course nearly corresponds with the line which I laid down in 1859. ("*Journal R. G. S.*, vol. 29.") The whole western and southern shores must remain as they were, for here we have the careful latitudes and longitudes of the Speke and Grant expedition

(1860-63); and, finally, the northern cannot, according to the explorer's observations, be removed far north. Yet Mr. Stanley gives his lake 1,000 miles, when the whole circuit of Captain Speke's is only 680 miles (direct geographical); and the area of the new Nyanza 32,515 square miles (230 and 180), nearly equals that of the old, (40,000). Here, then, is something wrong, unless the explorer, including every little projection and indentation of the shore, "bends, curves, inlets, creeks, bays, capes, and debouchures of rivers," prolonged to 1,000 miles what his map reduces, we will say, to 550.

Mr. Stanley has successfully proved, versus Major Long, that the Nyanza is even larger than I made it in 1859 (250 by 80 miles); it has become, in fact, one of the finest of inland seas in the world; but he has by no means been equally successful in establishing the theory that Captain Speke's Nyanza is a lake and not a lake region. He tells us boldly "They (the natives of Muwanda) gave us all the information we desired" — a very usual phenomenon among Asiatics and Africans. "Baringo," he continues, "they said, is the name applied to the people of Uguna to Nduru, a district of Ugeyeya, and the bay on which our boat rode, the extreme end of the lake; nor did they know, nor had they heard of any lake, large or small, other than the Nyanza." The Lake Baringo of Dr. Krapf and of Messrs. T. Wakefield and C. New (1865 and 1866-67), and the Bahári yá Pili (the Second Sea) alias the Bahári yá Ukárá (Sea of Ukárá), laid down by the two latter gentlemen, are not to be disposed of by the chance words of a few blacks. Mr. Stanley evidently knows nothing about the Baringo, except what he has seen in Captain Speke's map, the work, I may say it without indiscretion, of my friend Mr. Trelawney Saunders. In an earlier letter of more sober style, the traveler tells us "I have questioned the natives of Uchambi closely upon the subject at issue, but no one can satisfy me — though they speak positively — whether the lake is one piece of water or more. I hear a multitude of strange names, but whether they are of countries or lakes it is impossible to divine, for the people's knowledge of geography is naturally very superficial." Every African traveler well knows that the tribes with few exceptions are ignorant, except by hearsay, of the lands lying a few marches from their doors; and experienced men attach very little value to the term "boundless." We freely accept as truth all that Mr. Stanley sees, but by no means all that he hears. Indeed the shape of the Nyanza, itself, must greatly vary with the seasons. The traveler informs us "the descent to the lake is so gradual that I expect to find upon sounding it, as I

intend to do, that, although it covers a vast area, it is very shallow." And in another place we are assured, "in Iramba, between Mgongo Tembo (I'hembo) and Mombiti, we came upon what must have been in former times an arm of the Victoria Nyanza. It is called the Lumamberri plain, after a river of that name, and is about 40 miles in width. Its altitude is 3,775 feet above the sea, and but a few feet above (read below) the Victoria Nyanza. We were fortunate in crossing the broad, shallow stream in the dry season, for during the Masika or rainy season, the plain is converted into a wide lake." What more do we want to show that this is a lake or a lagoon-region?

It appears to me, then, that the controversy which has lasted for so many years can hardly be held finally settled. The Nyanza has certainly been proved to be a vast sweet-water sea, but the collection of minor features cannot be said definitively to have disappeared. On the contrary, when the whole region has been carefully surveyed, we shall probably find large and wooded tracts which, in the wet season, cause the lands about the eastern head reservoir of the Nile much to resemble the parts lying near its mouth.

Of the Tanganyika we can only repeat that the mass of evidence, as it lies before us, suggests a dead lake during the aries, drained at times of flood by a northern affluent feeding the "Luta Nzige," and by a western outlet, the Lukuga, falling into the Lualaba. The latter question may even now be settled by the gallant Lieutenant Cameron, concerning whom we may safely quote the old saw, *point de nouvelles, bonnes nouvelles*. Ill tidings fly fast even in Africa, and the long silence of the last months fairly entitled us to hope, even as we wish, for the best.

RICHARD F. BURTON.

ATHENÆUM CLUB, *October 19, 1875.*



# REPORT TO THE AMERICAN GEOGRAPHICAL SOCIETY OF NEW YORK ON THE KINGDOM OF CAMBODIA, THE RUINS OF ANGKOR AND THE KINGDOM OF SIAM.

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Lhuang — Thone — Hane — Raxat.

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TO THE HONORABLE PRESIDENT AND TO THE MEMBERS OF THE AMERICAN GEOGRAPHICAL SOCIETY OF NEW YORK.—I have the honor to submit to your respected judgment the result of my observations during my voyages, and of my studies on the curious and interesting countries of Indo-China, unfortunately too little known. I would feel only too happy if the truthful information which I am about to give you will prove of some use to the eminent society of which you are members, and if you will accept favorably this short sketch.

Cambodia was formerly called Kamphōxa-Nakhon, from which has been made the name of Cambodia, afterwards Kmer. It was then a great kingdom, extending from  $8^{\circ} 30'$  to  $20^{\circ}$  latitude. Its dominion extended over several States, including Lao and even Siam. About 300 years only have passed away since it lost its splendor. Attacked and harassed on one side by Siam and on the other by Cochin China it lost gradually almost its entire territory, and to-day there remains but an extent of about forty square leagues, divided into four provinces, viz.: Rhotisat or Poursat, Kampon-Sudī, Kampon-Som, and Kampot; the last two are maritime provinces.

About twenty-five years ago a Cambodian prince named Ougdouan was in prison at Bangkok (Siam), when the news came to that city that the king of Cambodia, his brother, who had taken refuge among the Anamites, had just lost his eye-sight. Immediately the King of Siam liberated Ougduang, conferred upon him the royal insignias, gave him large sums of gold and silver, and had him escorted with an army, under the orders of the Siamese general-in-chief, who

installed him as King of Cambodia. During the whole time of his reign, until his death, in 1864, Cambodia was tributary to Siam.

Ougduang left several children, the most important of whom were Phou-Kambô, twenty-five years old, and Phra-Nôrôdom, age twenty-four. At the time of the king's death, Phou-Kambô was in the northern provinces, Norôdom alone being in Udong, the capital.

During the same time, a man of great talents, M. de Loigréé, a lieutenant in the French navy, and commander of a gunboat, the "Hâche," then engaged in an expedition, landed at that city, and at once saw what great advantage he could derive from the circumstances for his government. Phou-Kambô, the heir to the crown, could not reach the capital in less than six weeks. Being a Siamese in his ideas, he (de Loigréé), resolved to profit by these circumstances, and, backed by his gunboat, he had Nôrôdom elected King of Cambodia, under the protection of France. Phou-Kambô heard at the same time of the death of his father and the coronation of his brother. With the aid of the mandarins who had remained faithful to him, he raised the standard of revolt, and during several years civil wars stained with blood and laid waste that rich but unfortunate country.

For two years Phou-Kambô, with the help of the Siamese and the kings of Lao, gained important advantages; among others may be cited the siege and capture of Udong, the capital, which he burned. Nôrôdom, aided by the French, after great exertions, preserved his crown. His brother, having been taken prisoner, was beheaded, as also all the principal mandarins, his officers. Nôrôdom transferred his court to Nuoum-Rhein, which became the temporary capital while the civil war was raging; but the country having been exhausted and ruined, that prince was unable to rebuild Udong and remained in the improvised capital, which thus remained definitively as such.

Cambodia is bounded on the south by the sea, north-west by Siam and east by the large River Mèkong. The country extending east is but a vast plain, whilst the west is mountainous and covered with forests. Its products are rice, ivory, silk, cardamom or Cambodiagum, gamboge, indigo, etc. (See Products of Siam.) Its total population is about 2,000,000 inhabitants, of which seven-tenths are purely Cambodians; the remainder is composed of Siamese, Chinese, Anamites, Laosians, Malabars, etc. Outside of the great Mèkong river the country has no water-courses of importance, and the mouth of the Kumpot river is the only harbor left to the Cambodians by the Anamites. There is at that place a small town of the same name, with a population of about 60,000 inhabitants. It carries on an

extensive trade, there being several hundred junks and more or less American and European vessels generally to be seen there. The other cities of the kingdom are insignificant. We shall only name Pong-Som, Kampot and Pinhalu, situated at some distance from the capital. As to physiognomy, complexion, general form, and even manners and customs, the Cambodians resemble the Siamese, but they seem more dull and savage. The women are skillful workers of silk, and weave striped "langoutis," ornamented with flowers, which are prized for their color and durability. The Cambodians possess the secret of a black metallic composition called "samrit," to which they attribute imaginary qualities. For instance, they claim that in a vessel of that metal red lime chewed with bétel never dries up; that the surface of the water contained in a vessel made of samrit, is higher in the middle than on the sides, etc. The Khmer or Khmene language is very odd; all the words having reference to religion are alterations of "Bâli;" the rest is a language by itself, somewhat harsh on account of the great number of consonants, and having no analogy with that of the neighboring peoples. The letter "r" occurs very frequently in their language, and they roll it like the Parisians. Their written characters are elegant, but too complicated and difficult. For that reason good copyists are rarely to be met with among them. In former times, Cambodia had its own money; now that of Siam and Cochin-China, and even of China, is used. It consists in silver "ticals;" bars of the same metal, or "naës," and in zinc "sapeques"—1,200 sapeques are equal in value to a five-franc piece, or a Mexican dollar.

#### RUINS OF ANGKOR.

At the northern extremity of Cambodia is a pretty lake called Thalesap, which is about seventy miles in circumference. It abounds in fishes. Every year, at low water, a very delicate, large fish, called "savai," is caught in great numbers. It is salted with the ashes of the palm tree, which imparts to its meat a sugar-sweet savor. It is near the shores of that lake that the marvelous ruins of the Nokorvat or Angkor are situated. They consist in a vast palace, colonnades, pyramids and temples or pagodas; all of cut and chiseled marble. Some of the domes and arches are of such exquisite workmanship that the Cambodians never speak of them without stating that it is the work of angels and not of men. According to all probabilities, and from information I gathered on the very spot, these ruins date from the time of the famous Cambodian king, Phra-Pathum

Suri-Wongse, under whose reign Somāna-Khōdom, a "talapoint" of Ceylon, brought the sacred books of the Buddhists and introduced the religion of Buddha in that country, himself becoming a Buddhist and a great reformer of that religion.

### SIAM.

The brief account which I am about to give of the history of Siam is taken from the annals of that country, which I transcribed verbatim. These annals are divided into two parts. The first, composed of three volumes only, entitled "*Phongsāvadā-Mûangnûa*" (or History of the Northern Kingdom), gives the origin of the Thai, and an epitome of their history up to the foundation of Juthiā. This first part is full of fables and gives few historical facts. The second part, which commences at the foundation of Juthiā, is composed of forty volumes, and relates the unbroken history of the Thai nation up to the present time. It begins in these words: "About 500 years before Jesus Christ there were two brothers of the Bramah caste, contemporaries of Somāna-Khōdom (Buddha), who both became holy hermits. One was called Saxonālai and the other Sithimoughon. Their sons and grandsons inhabited the villages governed by a holy woman, mother of Saribut, who was then the first disciple of Somana-Khōdom," et cetera. Under their advice their descendants built the town of Sang Kalak, which both hermits came to bless, and the kingdom of Sajān was founded. This kingdom remained during several centuries under the dominion of Cambodia until the accession to the throne of King Phra-Chaó-Uthong. Concerning this prince there are two stories. The first is, that this king had been reigning for seven years in Juthapat-Nakhon, a city built by one of the predecessors of that prince, when the country having been decimated by a fearful plague, Phya-Uthong, with his whole people, abandoned their land, and having turned to the south-west, after twenty days marching, reached the shores of a large river, where they found a circular island. He (the king) crossed the river to inspect the island and found there a hermit, who told him that in past centuries Somāna-Khōdom had been there, and had predicted that subsequently a large city would be built there. Phya-Uthong was delighted to hear this, and determined to establish his residence on that island. He had walls erected, a palace was built for himself, and he settled there with his whole people, and gave to his new city the name of Krump-Thəp-Maha-Vakhon-Si-Ajuthaja, which subsequently became celebrated under the

name of Juthiā. There is another version regarding the foundation of Juthiā: In certain copies of the annals it is related that a king of the Thaï nation having founded the city of Kamphëug-Phet, had a son who was remarkable for his talents. At his birth Indra (chief of the angels) gave him a cradle of gold; it is for that reason that he was called Uthong. This prince having succeeded his father, sent some of his officers to reconnoitre the country to the south. On their return they reported to the king that they had found a country most fertile and abounding in fish. Phya-Uthong thereupon emigrated with his entire people and built Juthiā on the island mentioned above. This second version seems more probable than the first; for should the first be admitted, it would follow that the Thaïs of to-day are not descended from the Thaï, but from the Cambodian race.

Siamese era  
712.

Christian era  
1350.

Phya-Uthong, after having founded Juthiā, took the title of Phra-Ramé-Suén, king of Lophaburi. The following is a list of the states which were under his dominion :

- |                                |                    |
|--------------------------------|--------------------|
| 1. Malaka.                     | 9. Chantabun.      |
| 2. Hava.                       | 10. Phitsanulôk.   |
| 3. Tanaosi (Ténasserim).       | 11. Sukkothaï.     |
| 4. Nakhon-Si-Thamarat (Ligor). | 12. Phixaï.        |
| 5. Tavaï.                      | 13. Savankha-Lok.  |
| 6. Mo-Ta-Ma (Martaban).        | 14. Phichit.       |
| 7. Meô-Lam-Lóng (Molméin).     | 15. Kamphëug-Phet. |
| 8. Song-Khla.                  | 16. Nakhon-Savan.  |

Nothing remarkable occurred after the foundation of Juthiā, under his reign, except his war in Cambodia, from whence he brought back a great number of captives. He died, leaving the crown to his son, in 731 of the Siamese era, and 1369 of the Christian era. The Siam era begins on the day of its deliverance from the yoke of Cambodia.

The Thaïs have two eras. The religious, or "Buolha," which dates back to the death of Khôdom, is now in its 2,397th year. [It is generally conceded that the death of Buddha occurred 543 years before Christ.] The civil era originated with an old Siamese king who reigned at Sangkahlôk; it now counts 1,216 years, and commenced in the 638th year of the Christian era. The year is composed of twelve lunar months of twenty-nine and thirty days, alternately, and every three years an additional month (the eighth repeated) is added. The months have no particular names; they are designated as the first, the

second, the third month, and so on. The first month generally commences in December. There are two cycles, the great and the short. The short cycle comprises the twelve years having the following names: the year of the rat, of the ox, of the tiger, of the hare, of the great dragon, of the small dragon, of the horse, of the goat, of the monkey, of the rooster, of the dog, and of the pig. The great cycle comprises sixty years; it is composed of the short cycle five times repeated; the years are also grouped by decades.

This is what the annals relate with reference to this point: "At this time the land of the Sajāms was under the dominion of the king of Kamphōxa-Nakhon (Cambodia), and paid him a tribute. It is related that Phrā-Rūang himself went to pay his respects and offer presents to the king of that country. Among them was a basket full of water, which did not escape through the interstices. The king of Kamphōxa-Nakhon, amazed at such a miracle, formed the design to have Phrā-Rūang murdered, fearing that should he be suffered to live, he would soon, through his genius, rise above all the other kings, but at the moment when the soldiers were about to seize Phrā-Rūang to kill him, this prince, gifted with the power of the Naghas (genii) sank down through the earth and disappeared; a few days later he was back in his dominions. From that time not only did Phrā-Rūang pay no more tribute to the king of Kamphōxa, but he was compelled to acknowledge him as his liege. It was at this time that the Sajāms took the name of Thaïs, which means 'free.'"

The country which we call Siam is named Murang-Thaï (kingdom of the free), in the vernacular of that country. Its former name was, as above mentioned, Sajām (brown race), whence is derived the word "Siam." Before the Portuguese had conquered Malacca, the dominion of Siam extended over the whole Malay peninsula, to Singapore. Subsequently, at the instigation and with the assistance of the English, the states of Djohore, Rhumbo, Salangore, Pahang and Perah, freed themselves from the rule of the sovereign, so that now the kingdom of Siam only begins at Tringam and extends from the 4° north latitude to the 22°, that is, a length of about 450 leagues. Its greatest width from east to west is about 150 leagues — from the 96° to the 102° longitude. It is bounded on the north by several Lao principalities, tributaries of Ava, or China; on the east by the Anam empire; on the west by the sea and the English possessions of the peninsula, and on the south by the small kingdoms of Pahang and Perah. The area of the kingdom of Siam is estimated to be about 12,330 square geographical miles.

The government of Siam is a despotic one to the fullest extent; the king is feared and respected almost as a God; nobody dares to look him in the face; when the courtiers attend an audience, they remain prostrated on their knees and elbows; when his majesty passes any where, everybody prostrates themselves to the ground, and should any one decline to submit to that custom, he would be liable to have his eyes put out by the archers who precede the king, and who are very skillful in shooting earthen bullets with a bow ever kept ready for use. The king's titles are very emphatic; he is called "Chào-phên-din" (the master of the earth), "Chào-Vivit" (the dispenser of life) "Phra-Maha-Krasat" (the august, great emperor), etc., etc. In Siam the crown is hereditary, but the eldest son of the royal family does not necessarily succeed to the throne as of right; the king can select his successor. Although the king of Siam has a despotic and absolute power, he is nevertheless subjected to certain rules to which he must conform; these rules are contained in a book entitled "Phra-raxa; mon thieraban." This book prescribes the hour of his rising and of his bath, the offerings to the talapoins, the time of audience for the mandarins, etc., etc. The king of Siam is very rich, which is easily accounted for, when it is known that all the taxes and imposts come to swell his treasury; to this add the presents and tributes of the kings and princes, who are under the dependency of the empire, and the produce of gold, copper and tin mines, which are worked for his special benefit. It is true his expenses are very large, for he has to pay the princes, the mandarins and the soldiers, besides the expensive maintenance of his extensive seraglio. According to an old custom, the king has a private treasury to which he can only resort in extreme necessity, and the successor adds to that which his predecessor has hoarded.

It is the custom in Siam to have a second king, who was formerly called "uparat," and is now styled "vangnà." He is usually a brother or cousin of the first king. He has an immense palace, which is almost as fine and sumptuous as that of the first king; he also bears the royal insignia; all passers-by are compelled to prostrate themselves before his pavilion situated on the banks of the river. He has his own court, his officers, his mandarins, precisely as the first king. It is he who generally leads the armies in times of war. The first king never undertakes anything of importance without his approval. He must, nevertheless, visit the first king from time to time; on such occasions he salutes by raising both his hands, but does not prostrate himself, and remains seated, leaning on his

elbow, as if an equal. It is a remarkable fact that previous to the slight misunderstanding which lasted but a few days last December between the two cousins, the vangnā had always lived harmoniously with the king. The royal treasury stands at the disposition of the vangnā whenever he needs it; but the request for funds must previously be submitted to the king, who approves of it by affixing his seal to it, after which it is transmitted to the high treasurer, who delivers the required sum.

### ●POLITICAL DIVISION.

The kingdom of Siam is divided in forty-one provinces, bearing the name of their capital, viz.:

#### *Nine provinces in the Center.*

- |                             |                  |
|-----------------------------|------------------|
| 1. Nouthaburi or Thalalat.  | 6. Ang-Thong.    |
| 2. Khuan.                   | 7. Mûang-In.     |
| 3. Pak-Tret.                | 8. Xaimât-Nakon. |
| 4. Pathummathani or Samkôk. | 9. Savan.        |
| 5. Tnthia or Krung-kao.     |                  |

#### *Five to the North.*

- |                              |            |
|------------------------------|------------|
| 1. Sâng-Khalôk.              | 4. Phixat. |
| 2. Phitsalôk or Phitsaunlok. | 5. Rahëng. |
| 3. Kampheng-Phet.            |            |

#### *Ten to the East.*

- |                  |                          |
|------------------|--------------------------|
| 1. Phetxabûn.    | 6. Pachim.               |
| 2. Bua-Hum.      | 7. Kabin.                |
| 3. Sara-Buri.    | 8. Sasông-São or Petrim. |
| 4. Nophaburi.    | 9. Battaboug.            |
| 5. Nakhon-Najok. | 10. Phanatsanikom.       |

#### *Seven to the West.*

- |                               |                                 |
|-------------------------------|---------------------------------|
| 1. Mûang-Sing.                | 5. Nakhon-Xaisi.                |
| 2. Suphamaburi or Suphan.     | 6. Sâkhouburi or Thachin-Samut. |
| 3. Kanchanaburi or Pak-Phrêk. | 7. Sougkhram or Mè-Khlong.      |
| 4. Raxaburi or Rapri.         |                                 |

#### *Ten to the South.*

- |                              |                           |
|------------------------------|---------------------------|
| 1. Nakhon-Khûen or Pakhlat.  | 6. Thung-Thaï.            |
| 2. Samuthaprakan or Packnom. | 7. Phétxaburi or Phiphri. |
| 3. Halaburi or Bang-Plasoï.  | 8. Humphon.               |
| 4. Rajong.                   | 9. Haija.                 |
| 5. Chanthaburi-Chanthabun.   | 10. Halang or Salang.     |



Besides these forty-one provinces, each governed by a "phyä," or mandarin of first rank, there are about twenty provinces of second and even third order, which are administered by mandarins of an inferior rank. Besides the kingdom of Siam (properly called), which is in the center, that country includes also, at the south, the kingdom of Ligov and four small Malay states, viz., Ouédah, Patani, Calantan and Tringann; to the east, part of Cambodia, Mûang-Korât and several Lao principalities; at the north the kingdoms of Lao, Hieng-Mai, Laphun, Lakhon, Muâng-Phri, Muang-Vang, Muang-Lôm and Luang-Phra-Bang; to which must be added the tribes of the Kongs, Kariengs, Lavas, et cetera. All these small states, tributaries of Siam, are compelled to present, every third year, gold and silver trees, and to furnish a certain number of troops, when required. Moreover, each of these states pays to its sovereign a tribute consisting of tin, ivory, benzoin, wax, cardamom, laque, teck-wood, and other productions, which vary according to the country. The population of that extensive country is not in proportion to its size; it is only about 8,000,000 inhabitants, who are distributed as follows:

Siamese or Thaïs.....	2, 500, 000
Chinese .....	2, 000, 000
Malays .....	1, 800, 000
Laos .....	400, 000
Cambodians .....	800, 000
Pegonans .....	150, 000
Birmans .....	600, 000
Kariengs, Xongs, and Lavas.....	40, 000
Klings, Arabs and Barmas.....	50, 000
	<hr/>
	8, 000, 000
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The great plain of Siam is bounded on the east and west by two mountain-ranges which extend from China, and are ramifications of the Hymalaya. The eastern range terminates at Cambodia, and the western extends to the extremity of the Malay peninsula. In the north these two mountain ranges draw near and form a number of small branches, which make of Lao a country almost entirely mountainous. The great plain, which is 150 leagues in length by fifty in breadth, is furrowed and watered by the large river Më-Nam, and several other rivers and innumerable canals, bordered with bamboos, tamarinds, and other fruit trees. It is also here and there dotted

with old palm-trees, the shelter of myriads of aquatic birds. The mountains, which rise in the form of an amphitheater, are all well wooded, and most of them are covered with impenetrable forests. The sea-shores offer highly picturesque and varied views along the coast from time to time; numerous islands are also seen, most of them adorned with a luxuriant vegetation, and yet but few are inhabited. In the Malay peninsula small rivers, or brooks only, are to be found, whose course is but thirty, fifty, scarcely ever 100 miles long; but the eastern part of Lao and Cambodia are watered by a large river called Mē-Kong, which is over 2,000 miles in length. An idea of its width can be formed from the fact that an elephant seen from the opposite shore is scarcely discernible. Chanthabun has a pretty river, which, in the rainy season, overflows and fertilizes a small plain about forty miles long. The rivers Pēt-Rin, Tha-Chin, and Mē-Khlong have a majestic mouth, and also fertilize the great plain of Siam by an annual inundation, uniting their waters with that of the Mē-Nam river (mother of the waters), whose course is about 1,000 miles long, and which heads in Chiang-Mai, receives a large tributary coming from Phitsalōk, and a little below separates in several branches, which water the great plain, unite above Bangkok, and at last debouch into the sea, eight leagues below the capital.

#### CLIMATE.

The climate of Siam is more or less warm, according to the latitude, but the heat is bearable, as it can be tempered by frequent baths; besides, the abundant rains which fall during the warm season cool the temperature. Strictly speaking, there are but two seasons—the rainy and the dry seasons. As soon as the south-west monsoon commences to blow, the winds which have passed over the seas bring every day white clouds, which in the evening collect along the summits of the great range of mountains which bound Siam on the west, and at sunset a violent wind rises; these condensed clouds are scattered, the thunder rumbles, and in the midst of the tempest an abundant rainfall waters the whole plain. During the whole rainy season this phenomenon renews itself almost daily, and every evening one can almost certainly expect a violent thunder storm. Every year in March another rather singular phenomenon takes place, but with the dew. At the dawn of day the atmosphere becomes filled with white fog, and scarcely has the sun risen when this fog resolves itself into an abundant dew, even to the extent of running like rain from the roofs of the houses and the leaves of the trees.

## CUSTOMS.

The Siamese belong to the variety of the human family which ethnologists call the Mongolian race. Their average height is five feet to five feet six inches; their lower limbs are strong and well proportioned, the body long, the shoulders broad, and the chest well developed; a short neck and a well poised head; their hands are large, their complexion olive; the upper part of the forehead is narrow, the face wide between the cheek bones and the chin again narrow. The eyes are black and well shaped, the white being of a yellowish tint; the nose is slightly flattened, the nostrils expanded; the lips protrude a little, the hair jet black and coarse. They dress the hair in a tuft on top of the head, the rest of the head and the face being shaved, and pull out the scanty hair which grows on their chin and upper lip. The women also keep a tuft of hair on their head, but of less height, and always oiled and well combed. The Thais have no geographical maps, not even of their own country. They simply write in succession the names of the cities and villages of each province, stating their approximate distance. But few princes or mandarins possess European atlases or maps.

## MINERALS.

The principal minerals found in Siam may be mentioned. There are extensive salt works where the sea-water is evaporated under the heat of the sun. When the crust is sufficiently thick it is broken, the salt gathered in large heaps and then loaded on barges. Besides the ordinary salt, a bitter salt or sulphate of magnesia is formed, which is used as a purgative. In Siam a great quantity of saltpetre is used for the manufacture of gunpowder and fireworks. This is the way in which it is prepared: The ammoniacal dung of the bats is gathered in the caverns where they live; it is allowed to remain several days in lye water; it is then filtered, evaporated in a large open cauldron, and, on cooling, fine crystals of saltpetre are obtained.

Gold is found in several localities, but the most celebrated gold mine is that of Bang-Taphan, in the province of Humphon, at the foot of high mountains, called the Three-Hundred-Peaks. Gold is found in grains up to the size of a pepper-corn.

Silver has not yet been found in the native state, but it has been found in combination with copper, antimony, lead and arsenic.

Copper mines are very abundant. There are mountains almost

entirely composed of carbonate of copper, which yield thirty per cent. of metal. Almost the whole of the copper which is obtained has been used until now to make colossal idols.

It is tin which constitutes the greatest mineral wealth of Siam, being found in abundance in several provinces, especially in those of Halang, Haija, Humphon, Rapri and Phâk-Phrèk. The greatest part of that trade is done with Singapore, which can be said to be almost exclusively supplied with that ore from Siam. There are also in the mountains of Phâk-Phrèk and of Suphan abundant lead mines, which undoubtedly contain silver. Antimony and zinc are to be found in the mountains of Rapri, but they are not mined. I have seen the iron mine of Tha-Sing, of which the Chinese have reaped such benefit. A canal leads to it. The ore is found in large pebbles of carbonate of iron, which cover the plain over a considerable extent. It is asserted that this iron is natural steel. It is certain that there are precious stones in several localities of the kingdom of Siam, since in my travels I have frequently found specimens in the beds of torrents and among pebbles; but nowhere are they so numerous as in the province of Chanthabun. The king of Siam has reserved for himself certain localities where the precious stones are finest and most abundant. It is the governor of that province who is commissioned to have them worked and to send the finest gems to the palace, where unskillful Malay lapidaries polish and cut them according to their own fashion. The finest I saw at that mandarin's were large pieces of quartz perfectly transparent, cats-eyes or chatoyant stone of the size of a small walnut, magnificent topazes, hyacinths, garnets, dark-blue sapphires, rubies of various shades, etc.

#### VEGETABLE PRODUCTIONS.

The vegetables which grow in those countries are almost entirely different from ours, and a list of them would be both long and tedious. I shall merely mention the most important and interesting. They are rice, the principal food of that people, of which there are forty varieties; arec, bétel, curcunia or saffron, corn, cucumbers, pumpkins, turnips, cabbages, mustard, lettuce, patèques, or water-melons, melongénes, or melons of every shape and color, tomatoes, celery, mint, parsley, chervil, cumin, coriander, garlick, onions, leeks, peas, beans, and many other edible plants whose English names are unknown to me. There are several varieties of potatoes in the mountains and forests. In several provinces a very precious and

useful plant is cultivated; it is the ground-pistachio, whose roots are covered with beans, very good to eat; excellent cakes are made with it. The sesame is also cultivated. A species of large basilie, called meng-hak, produces a small seed, a pinch of which, in a glass of water, swells, fills the whole glass, and forms a very palatable and refreshing emulsion. Canals and ponds also produce plants precious for their utility; the lotus, with its long, succulent stems, whose seed makes an excellent meal; the macre, or water-chestnut; the bind-weed, whose tender stems, when cut off, immediately grow again and multiply rapidly; also, a species of cress with hairy stems, etc., etc. The principal productive trees are several kinds of palms, the sago, the dourion, the mangoustan, the mango, the bread-tree, the jaquier, the jamboisier, the ma-prang, or plum-tree, with golden-colored plums; the lamut-sida, another variety of plum-tree, but bearing a reddish-brown fruit; the thakhole, another kind of plum-tree, the fruit of which is red, but the pulp green; it is agreeably tart and strewn with small seeds, which are swallowed with the pulp; the China fig-tree, which produces a smooth-skinned, golden-colored fruit, highly perfumed; the lam, three species of jai, or litehi, the sathon, the tamarind, the guava, the papan-tree, the custard-apple, the banana, several species of orange-trees, the lemon-tree, the jujube-tree, the pineapple, the carambol, wild olives, the almond-tree, the makok-tree, the India poplar, the pipal-tree, wild grapes, bamboos, the rattan, dye-woods, teck-wood, cinnamon, turpentine oil, sandal-wood, ginger, pepper, tobacco, coffee, cotton, sugar, benzoin, the eagle-wood, cardamom, gamboge, indigo, gutta-percha, and the tree which the Siamese call rak. This is a variety of the banana, also called varnish-tree; it yields that fine varnish which is so much admired on the small articles of furniture which are brought from China.

Among the flowers which we possess in America, and which are also found in Siam, I have remarked several varieties of roses, the immortelle, the India-pink, the jessamine, the night-shade, the amaranth, the small lily, the sunflower, the pink-laurel. According to the Siamese, it is not the rose which is the queen of flowers, but the large memphar, which is also called nymphaea, or lotus. They have also the mali, the champa, the kadanga, the phut, etc., etc.

#### ANIMALS.

I do not pretend to mention here all the animals which inhabit those countries, as the list would be too long, but shall merely name

the principals: The white and black elephant, three species of tigers, the rhinoceros, the horse, the ox, the buffalo, the tapir, the bear, the pig, the wild boar, the porcupine, the elk, the stag, the deer, the roe, the gazelle, the wild goat, the dog, the cat, the civet-cat, several species of monkeys and squirrels, the otter, the hare, different varieties of rats, etc., etc. The small eagle, the hawk, two kinds of vultures, the argala, the crow, the owl, the eagle-owl, the scops-eared owl, the fern-owl, the karien, the pelican, the crane, the heron, the cormorant, the stork, the wild goose, the diver, the water-hen, the teal, the gull, the alcyon, the white ibis, the peacock, several varieties of pheasants, the wild-rock, the toneau, the calao, several species of parrots, two kinds of partridges, pigeons, turtle-doves, black-birds, dominicans, humming-birds, etc., etc. The bats, several kinds of crocodiles and lizards, the chameleon, the flying-lizard or dragon, the small boa constrictor, several kinds of serpents and frogs, centipedes, scorpions, cancrelas mosquitoes, several kinds of fire-flies or luciolles, etc., etc. Divers species of turtles, whales, the blower, the porpoise, the shark, the saw-fish, the dolphin, the bonito, the gold-fish, the ray, the sole, the salmon, the sardine, the sea-shrimp, the kapi, the crab, the sea-dog (or sea-bichon), the kahi-khraï, the mengphû, the retreating-fish, the dog-tongue, the craw-fish, the eel, the mussel, the oyster, the cowry, the tridacne, the pearl-mussel, the crumpet-shell (or whelk), the nautil-tarck, etc., etc., and a great number of other cetacea, fishes, mollusks, etc., etc., whose Siamese and English names I do not recollect.

### DESCRIPTION OF THE TEMPLE OF ANGKOR.

Nokhor, or Angkor, was the capital of the ancient kingdom of Cambodia, or Kmer, formerly so famous among the great states of Indo-China, that almost the only tradition preserved in the country mentions that empire as having had twenty kings who paid tribute to it, as having kept up an army of five or six million soldiers, and that the buildings of the royal treasury occupied a space of more than 300 miles.\*

In the province still bearing the name of Ongkor, which is situated eastward of the great lake of Touli-Sap, towards the 14° of north latitude, and 104° longitude east of Greenwich, there are on the banks of the Mekon, and in the ancient kingdom of Tsiampais (Cochin China), ruins of such grandeur, remains of structures which must

\* See Mouhat, Henry — London, 1864; in two vols., vol. I.

have been raised at such an immense cost of labor that, at the first view, one is filled with profound admiration, and cannot but ask what has become of this powerful race, so civilized, so enlightened, the authors of these gigantic works?

One of these temples — a rival to that of Solomon, and erected by some ancient Michael Angelo — might take an honorable place beside our most beautiful buildings. It is grander than any thing left to us by Greece or Rome or Persepolis, and presents a sad contrast to the state of barbarism in which the nation is now plunged.

Unluckily the scourge of war, aided by time the great destroyer who respects nothing, and perhaps also by earthquakes, has fallen heavily on the greater part of the other monuments, and the work of destruction and decay continues among those which still remain standing, imposing and majestic, amidst the masses of ruins all around.

One seeks in vain for any historical souvenirs of the many kings who must have succeeded one another on the throne of the powerful empire of Maha-Nocor-Khmer. There exists a tradition of a leprous king, to whom is attributed the commencement of the great temple, but all else is totally forgotten. The inscriptions with which some of the columns are covered, are illegible; and, if you interrogate the Cambodians as to the founders of Angkor-Wât ("Wât," temple), you invariably receive one of these three replies: "It is the work of the giants," "It was built by the Leprous King," or else "It made itself."

The work of giants! The expression would be very just, if used figuratively, in speaking of these prodigious works, of which no one who has not seen them can form any adequate idea; and in the construction of which patience, strength and genius appear to have done their utmost in order to leave to future generations proofs of their power and civilization.

Although making no pretention whatever to architectural or archæological acquirements, I will endeavor to describe what I saw for the benefit of others interested in these sciences, and, as well as I can, to draw the attention of eastern *savans* to a new scene. I shall commence with the temple of Angkor, the most beautiful and best preserved of all the remains, and which is also the first which presents itself to the eye of the traveler, making him forget all the fatigues of the journey, filling him with admiration and delight, such as would be experienced in finding a verdant oasis in the sandy desert. Suddenly, and as if by enchantment, he seems to be transported from barbarism to civilization, from profound darkness to light.

Before arriving at Angkor, from Battambang, having previously crossed the great lake from the mouth of either of the currents which traverse both these localities, you come upon a stream, which, in the dry season, you ascend for a couple of miles, and reach a spot where it becomes somewhat larger, forming a small natural basin, which serves the purpose of a kind of harbor. From this place a raised causeway, still passable at the present day, and extending as far as the limit which the waters attain at the period of the inundations, that is to say, over a space of three miles, leads to New Angkor an insignificant little town, the capital of the province, and situated fifteen miles to the north-north-west of the shores of the lake.

If, starting from this point, you follow for about a couple of hours in the same direction a dusty, sandy path, passing through a dense forest of stunted trees, and having also frequently crossed the river, which is exceedingly sinuous in its course, you will arrive at an esplanade about twenty feet wide by ninety long, parallel to the building. At each angle, at the extremity of the two longer sides, are two enormous lions, sculptured out of the rock, and forming, with the pedestals, only a single block. Four large flights of steps lead to the platform.

From the north staircase, which faces the principal entrance, you skirt, in order to reach the latter, a causeway 700 feet in length by nine feet in width, covered or paved with large slabs of stone, and supported by walls of great thickness. This causeway crosses a ditch 675 feet wide, which surrounds the building; the revetment, ten feet high by three thick, is formed of ferruginous stone, with the exception of the top row, which is of freestone, each block being of the same thickness as the wall.

#### PRINCIPAL ENTRANCE.

The edifice forms a long gallery with a central tower, and two others, of rather less altitude, about 100 feet distant from the former. The portico of each tower is formed of four projecting columns, with a staircase. At each extremity are similar porticos, beyond which, but immediately contiguous thereto, is a high door or gateway, on the same level, which serves for the passage of vehicles. From constant use the wheels have worn two deep ruts in the massive flagstones with which the ground is paved.

Upon the west side the gallery is supported by two rows of square columns; on the east, blank windows have been let into the wall with stone railings or balconies of twisted columns, fourteen centi-



meters in diameter. The whole of this side, within three feet of the ground, and one foot and a-half of the cornice, is covered with sculptures executed with marvelous artistic skill.

The roof — and in this respect it resembles all the other buildings — is a double one, constructed externally of sculptured stone, the blocks in the interior being plain ; they were formerly hidden by a ceiling, also sculptured, of which some remains may still be remarked. The edifice divides the wall into two equal parts ; upon the other sides, and facing the monument, are three pavilions, 120 feet in length.

This imposing colonnade, which, from its great length and beautiful proportions, attracts the eye from a distance, forms a fitting entrance to the great monument.

#### THE TEMPLE.

Commencing from the building which forms the principal entrance, is a second causeway, thirty feet wide by 1,050 feet in length ; it is raised three feet and a half from the level of the ground. It is covered with huge blocks of stone, carefully joined together throughout its entire length, and is surrounded by a balustrade, partially in ruins, about ten centimeters high, composed of long stones, with beveled edges, very massive, and covered with sculptures. On each side are six platforms of earth, ascended by several steps, upon each of which is a serpent with seven heads, some of which are erect, others thrown back.

In the center of the causeway are two elegant pavilions, one on each side, having at each extremity a portico 110 feet in length. At the end of the causeway, and at the foot of the terrace, on each side of the latter, are two ponds or sheets of water. A balustrade like that of the causeway and like it resting upon a sculptured basement, springs from the foot of the terrace and runs all round the monument. At certain intervals there are large staircases of several steps each.

#### THE TERRACE.

The terrace is seven feet in height, and is surrounded by 112 fluted columns, surmounted by capitals, formed in each case of one single block of stone. The basement, like that of the whole building, is ornamented with very beautiful sculptured cornices, varied in style, and entirely covered with delicate carvings representing roses and arabesques, worked with the chisel, with a taste and skill equally wonderful.

This terrace forms a cross, each arm of which is 390 feet in length, and forty wide. There are three flights of steps, upon each of which are four lions reclining upon their pedestals.

#### THE PORTICO.

This is twenty feet in length, and is supported by six columns, four of which are detached from the monument. The temple is formed of three distinct parts, raised in the form of terraces, one above the other.

#### THE GALLERIES.

The galleries form a rectangle, the façade of which is 550 feet in length; the sides 700 feet by about fifteen feet. The vaulted ceilings of the galleries are raised twenty feet from the ground; those of the second roof are fifteen feet high. The two roofs are supported by a double row of columns, the first being twelve feet and the second eight feet high, by two feet broad. The columns are square, and, like all other buildings in the province, are formed of single blocks. There are five staircases on the west side, the same number on the east, and three on each of the remaining sides. The basement is twenty feet in height, the length externally forming a terrace of six feet. Each portico is composed of three roofs, raised one above the other, which contribute materially to give the architecture of these long galleries a monumental appearance, producing a singularly beautiful effect. The opposite side of the wall to the double colonnade is, from the lowest row of cornices to four feet above its base, covered inside with bas-reliefs having externally blank windows with balustrades. There are two rows of cornices, the first part immediately above the columns, and the space, to the extent of nearly four feet, which lies between them, is filled up by roses and other sculptured designs. The bas-reliefs represent the combat of the king of the apes with the king of the angels.

(These sculptures represent the story of the Hindoo Ramdyana of great reputation among Buddhist nations. The angel is Ramana, king of Ceylon, and the king of the monkeys, Hanuman, Rama's general.) In the center is the king of the angels, drawn by two griffins; he has seven heads and twenty arms, with a sabre in each hand. Some of the chiefs are seated in cars drawn by fabulous animals, while others are mounted on elephants. The soldiery are armed with bows, javelins or sabres; but the apes have generally no

weapons except their formidable claws. A few of them have clubs, sabres or branches of trees.

In peristyle No. 1, is represented the march of warriors mounted on birds, horses, tigers and fabulous animals; the horses of the chiefs are led by the bridle. On the right the soldiers are advancing towards the scene of combat in the center, but here there are no fantastic animals.

The bas-reliefs of the second peristyle also represent a combat between the king of the apes and the king of the angels, and the death of the former. Close by is a boat filled with rowers, all with long beards, and some of them attired in the Chinese fashion. The group is admirable for the natural positions and for the expression given to the faces. A cock-fight and women at play with their children are also represented. It is in these bas-reliefs that the highest degree of skill is shown. Other subjects follow, the meaning of which I could not discover.

On the south side, to the left hand, is a military procession — bodies of soldiers headed by chiefs, some mounted on elephants, others on horseback, and each corps carrying different arms: lances, halberds, javelins, sabres and bows. On the right are two series, one representing the Hindoo paradise Swarga, the other the Hindoo infernal regions Naralma. A crowd of persons are entering paradise, and are received in palanquins; they have with them banners, fans, parasols, and boxes for holding betel, without which even paradise would not be perfect happiness to a Cambodian.

A triumphal march in paradise shows the elect seated on a magnificent dais, surrounded by a great number of women, with caskets and fans in their hands, while the men are holding flowers and have children on their knees. These appear to be all the joys of paradise.

The punishments of the infernal regions, on the contrary, are varied and numerous; and while the elect, who are enjoying themselves in paradise, are all fat and plump, the poor condemned beings are so lean that their bones show through their skin, and the expression of their faces is pitiful and full of a most comic seriousness. Some are being pounded in mortars, while others hold them by the feet and hands; some are being sawn asunder; others are led along like buffaloes, with ropes through their noses. In other places the compubal (executioners) are cutting men to pieces with sabres, while a crowd of poor wretches are being transfixd by the tusks of elephants or on the horns of rhinoceros. Fabulous animals are busy devouring some; others are in irons, and have had their eyes put out.

In the center sits the judge with his ministers, all with sabre in hand, and the guilty are dragged before them by their arms or feet. In the distance a furnace is visible and another crowd of people under punishment who are being tortured in divers ways—impaled, roasted on spits, tied to trees and pierced with arrows or suspended with heavy weights attached to their hands and feet, some being devoured by dogs or vultures, or crucified with nails through their bodies. These bas-reliefs are perfect, the rest are inferior in workmanship and expression. On the east side a number of men, divided into two equal groups, are represented attempting to drag in contrary directions the great serpent or dragon with seven heads, while in the center an angel stands looking on. Many angels are seen floating in the sky above, while fishes, aquatic animals and marine monsters swim about in a sea visible beneath. The angel is seated on the celebrated mountain of Thibet, Phra Soumer, and in different places angels with several heads give assistance to those pulling the serpent. The king of the apes, Sdach Soà, appears here. To the right is a military procession and a combat, the chiefs being mounted on elephants, unicorns, griffins, eagles with peacocks' tails and other fantastic animals, while winged dragons draw the cars. On the northern side is sculptured a combat and procession, with drums, flutes, trumpets, tam-tams, organs said to be Chinese, and a king mounted on the shoulders of a hideous giant. All the chiefs take part in the combat, standing some on tigers, others in cars. Near the central peristyle is a figure of the king, with a long beard; on either side are courtiers with clasped hands.

On the right appears a military procession, a combat, griffins, eagles with peacocks' tails, a dragon with seven heads and a tower on his back; the king is shooting an arrow, standing on the back of a giant with tail, claws and beak.

The first gallery of the second story on the west side is connected with the second by two other smaller galleries, 150 feet long, and which are themselves connected by two colonnades in the form of a cross, supporting two vaulted roofs. Here also are to be seen four rows of square columns, each hewn out of a single block of stone, those in the inside row being fifteen feet high and two thick; those on the outside being eleven feet high and rather smaller at the top than at the base. The little gallery on the right is filled with statues representing persons in the act of worshipping idols, some of these being of wood, others of stone. Many of the statues are fifteen

feet in height, and the greater number of them must be of great age, from their state of dilapidation. In the center is a statue of the famous leprous king, and by his side, in a posture of adoration, are two statues of priests, with faces full of expression. These are real masterpieces. At no great distance is a small statue of his queen.

Here are seen two pavilions of extremely elegant architecture, with porticos and staircases at each end.

There is a second gallery, with four towers at each end, and three porticos and staircases on each side. This gallery is raised on a base twenty feet high, the ledge of which forms a terrace three feet broad.

There are neither columns nor bas-reliefs here, but the walls have imitation windows with twisted bars; the gallery is half dark, receiving very little light except through the doors. There are idols, both of stone and bronze, on pedestals, with their hands held out to receive gifts from their worshipers.

A raised terrace in the central part leads to the foot of the great staircase and forms a cross, the arms of which lead to two small pavilions with four porticos and staircases. The base of this part is admirably executed, both as to general effect and in detail. There are twelve staircases, the four in the middle being twenty feet wide, and having thirty-nine steps.

The building forms a square, each side of which is 190 feet, and at each angle is a tower. A central tower, larger and higher, is connected with the lateral galleries by colonnades covered, like the galleries, with a double roof; and both galleries and colonnades are supported on a base four feet from the floor of the interior courts.

Opposite each of the twelve staircases is a small portico with four columns fifteen feet high, and two in diameter. Windows, similar in form and dimension to those of the other galleries, are on either side, and have twisted bars carved in stone.

In front of each colonnade, with an entrance in the tower, is a dark and narrow chapel, to which there is an ascent of eight steps. These four chapels do not communicate with each other; each contains an idol thirteen feet in height, sculptured in the solid wall, at whose feet is another nearly seven feet long, representing Samana-Kodom sleeping. The central tower is 125 feet high from the pavement of the gallery, and 175 from the basement of the building.

What strikes the observer with not less admiration than the grandeur, regularity, and beauty of these majestic buildings, is the immense size and prodigious number of the blocks of stone of which they are

constructed. In this temple alone are as many as 1,532 columns. What means of transport, what a multitude of workmen, must this have required, seeing that the mountain out of which the stone was hewn is thirty miles distant! In each block are to be seen holes one and one-half inches in diameter and two in depth, the number varying with the size of the blocks; but the columns and the sculptured portions of the building bear no traces of them. According to a Cambodian legend, these are the prints of the fingers of a giant, who, after kneading an enormous quantity of clay, had cut it into blocks and carved it, turning it into a hard and, at the same time, light stone by pouring over it some marvelous liquid.

All the moldings, sculptures, and bas-reliefs appear to have been executed after the erection of the building. The stones are everywhere fitted together in so perfect a manner that you can scarcely see where the joinings are; there is neither sign of mortar nor mark of chisel, the surface being as polished as marble. Was this incomparable edifice the work of a single genius, who conceived the idea, and who watched over the execution of it? One is tempted so to believe; for no part of it is deficient, faulty, or inconsistent with the other. To what epoch does it owe its origin? As before remarked, neither tradition nor inscriptions furnish any certain information upon this point. These latter are a sealed book for want of an interpreter; they may, perchance, throw light on the subject when some European or American savant shall succeed in deciphering them.

### RUINS AT MOUNT BAKHÊNG.

These are the ruins of a temple about 325 feet above the valley, built of limestone, on the top of Mount Bakhêng, situated two miles and a-half north of Angkor-Wât, on the road leading to the town. At the foot of the mountain are to be seen, among the trees, two magnificent lions, one and a half feet in height, and each cut, with the pedestals, out of a single block of stone. Steps, partly destroyed, lead to the top of the mountain, whence there is so beautiful and extensive a view that it is not surprising that a people who have shown so much taste in their buildings, should have chosen it for a site. On one side you gaze upon the wooded plain and the pyramidal temple of Oncor, with its rich colonnades, and the mountain of Crome, beyond the new city, the view losing itself in the waters of the great lake on the horizon. On the opposite side stretches the long chain of mountains, whose quarries, they say, furnished the beautiful stone

used for the temples; and amidst thick forests which extend along the base, is a pretty little lake, which looks like a blue ribbon on a carpet of verdure. All this region is now as lonely and deserted as formerly it must have been full of life and cheerfulness; and the howling of wild animals and the cries of a few birds alone disturb the solitude. Sad fragility of human things! How many centuries and thousands of generations have passed away, of which history, probably, will never tell us anything; what riches and treasures of art will remain for ever buried beneath these ruins; how many distinguished men — artists, sovereigns and warriors — whose names were worthy of immortality, are now forgotten, laid to rest under the thick dust which covers these tombs!

The whole summit of the mountain is covered with a coating of lime, forming a vast smooth surface. At regular intervals are four rows of deep holes, in some of which still stand the columns that formerly supported two roofs, and formed a gallery leading from the staircase to the principal part of the building, and the transverse branches of which were connected with four towers, built partly of stone, partly of brick. Judging from the details of the work and the state of the stone, which in many places crumbles at a touch, this building belongs to a period much anterior to that of many of the other monuments. Art, like science, was then in its infancy; difficulties were surmounted, but not without great efforts of labor and intelligence. The temple of Mount Bakhêng appears to have been raised in the beginning of the civilization of the country, while that of Angkor-Wât was probably its climax.

In the two towers which are least dilapidated, and which the modern worshipers have covered with a thatched roof, the old one having fallen in, are large idols rudely fashioned, and bearing marks of great age. In one of the other towers is a large stone, the inscription on which is still visible; and on the exterior wall is carved the figure of a king with a long beard, the only portion of bas-relief remaining.

A wall surrounds the top of the mountain. Bakhêng has also its Phrâbat, but it is a fac-simile of recent origin. The building is quadrangular, and composed of five stories, each twelve feet high; that at the base is 180 feet square. They form so many terraces, which serve as bases to seventy-two small but elegant pavilions, and they are enriched with moldings, colonnades, and cornices, but no sculpture. The work is perfect, and from its good state of preservation would seem to be of a more recent date than the towers. It is

evident that each of these little pavilions formerly contained an idol. Each side of the square has a staircase seven feet wide, with nine steps to each story, and lions on each terrace. The center of the terrace formed by the last story is only a confused mass of ruins from the fallen towers. Near the staircase are two gigantic blocks of very fine stone, as polished as marble, and shaped like pedestals for statues.

G. D'ABAIN.

NEW YORK, *June* 10, 1875.



## REPORT OF THE HYDROGRAPHIC COMMISSION OF PERU ON THE AMAZON RIVER.

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IQUITOS, PERU, *December 16, 1873.*

The steamers *Mairo* and *Tambo* for exploring purposes being placed under the orders of the commissioners, along with the first assistant, Mr. J. H. Rocheile; the surgeon, Francis L. Galt; the engineer, J. W. Sparrow, and the secretary, L. M. Mesnier, we embarked on board of the *Tambo*, with the chronometer and other instruments.

The second assistant, Mr. W. R. Butt, and the civil engineer, Nelson B. Noland, went on board of the *Mairo* with the instruments necessary for the task intrusted to them. On the seventeenth of September the steamer *Mairo* left with the object of exploring the River Nanay. On the following day the *Tambo* left her anchorage at Iquitos and proceeded down the Amazon for the purpose of commencing the duties of the commission along the frontiers of Brazil.

On the twenty-seventh of the same month we arrived at the mouth of the River Yavari and remained there some days to determine with greater exactness its position by astronomical observation. The River Yavari has three mouths, of which the lower was fixed upon as being the most important, and great care was taken to determine its position correctly.

On the twenty-ninth of September the *Tambo* left this point, and ascending the River Amazon, we arrived at Iquitos on the twelfth of December, having determined various points on the way by astronomical and other observations. We found the *Mairo* at anchor at Iquitos, having returned on the second of October from an exploration of the River Nanay. On the twenty-seventh of October the *Mairo* left Iquitos to explore the Rivers Morona, Potro, Pastaza and Tigre. From the twenty-eighth of October to the twentieth of November the *Tambo* continued navigating in the river, stopping at the important points to determine their several positions. On November 20th the *Tambo* arrived at an obstacle or *mal paso*, a little above Punta Achual, as far as which the river can be navigated

without danger. As the navigation of the Amazon, above Punta Achual, is always difficult, especially for merchant vessels, it would be better, if a road is opened up into the Alto Amazon, to let it terminate at a point on the river before reaching Punta Achual.

It would be necessary to have a topographic plan constructed to determine which point was best, bearing also in mind that the road should terminate at a point not liable to be affected by inundations of the river, as well as offering easy access to merchant vessels; some point near Barranca would be the most suitable. The banks of the Marañon are generally low and exposed to be overflowed at the time of the annual rises of the river. On the twenty-second of November, the *Tambo* left Punta Achual, descended the Amazon to the mouth of the River Huallaga, and commenced the ascent of it on the twenty-fourth. The ascent occupied five days, stopping at Yurimaguas and other points, whose positions were determined. On the twenty-ninth the *Tambo* arrived at Rumi-Callarina, which was considered the terminating point for trading vessels. Its position was laid down with care. It was reported that a road had been begun to this point by the prefect of Loreto, which, it was thought, would not be difficult to accomplish, and would be of great benefit to this part of Peru. The lands on the banks of the Huallagas, from Lagunas Rumi-Callarina, were out of the reach of inundation, and very suitable for plantations. On the sixth of December, both the exploring steamers had returned to Iquitos.

To the above are added tables showing the latitudes, longitudes, distance from Iquitos, and from the mouth of the Yavari river, magnetic variations of the compass, and observation on the currents. The charts of the explorations and the meteorological observations taken by Surgeon Galt, accompanied the report to the government. The following are the tables referred to above :

TABLE OF LATITUDES AND LONGITUDES.

PLACES.	Latitude South.	Longitude West of Greenwich, in degrees.	Longitude West in time.
	° ' "	° ' "	H. M. S.
<b>RIO AMAZON.</b>			
Mouth of River Yavari .....	4 18 45	69 53 10	4 39 32
Letitea .....	4 10 57	69 49 21	4 39 17
Loreto .....	3 54 20	70 7 45	4 40 31
Iquitos .....	3 44 15	73 7 30	4 52 30
Mouth of River Ucayali .....	4 28 30	73 21 30	4 53 26
Nauta .....	4 31 30	73 27 0	4 53 48
Santa Cruz de Parinari .....	4 36 30	74 6 30	4 56 26
Barranca .....	4 59 53	76 38 38	5 6 34
Punta-Achual .....	4 15 27	77 1 28	5 8 5
<b>RIO HUALLAGA.</b>			
Yurimaguas .....	5 51 55	75 59 58	5 3 59
Rumi-Callarina .....	5 58 32	75 47 32	5 3 10

J. H. ROCHELLE.

T. B. TUCKER.

IQUITOS, December 10, 1873.

The report then gives the following table of distances of the entrance to the Yavari river and of Iquitos :

*Table of Distances from the Mouth of the Yavari river and from Iquitos.*

PLACES.	Distance from the mouth of River Yavari in marine miles.	Distance from Iquitos in marine miles.
Mouth of the Rio Yavari .....	00	315
Tabatinga (Brazil) .....	14	301
Letitea .....	17	298
Loreto .....	53½	261½
Port of Pebas .....	198	117½
Tigre .....	235	80½
Iquitos .....	315	00
Tamshi-yacu .....	334½	19½
Mouth of the Ucayali .....	376¾	61¾
Nauta .....	383½	68½
San Regis .....	418¾	103¾
Mouth of the Tigre-yacu .....	434	419
Santa Cruz de Parinari .....	461½	146½
Vaca Marina .....	523	208

PLACES.	Distance from the mouth of River Yavari in marine miles.	Distance from Iquitos in marine miles.
Elvira .....	541	226
San Pedro .....	557 $\frac{1}{2}$	242 $\frac{1}{2}$
Fontevera .....	597	282
Mouth of the Huallaga .....	619	304
Mouth of the Pastaza .....	702 $\frac{1}{2}$	387 $\frac{1}{2}$
Cedar island .....	633 $\frac{1}{2}$	318 $\frac{1}{2}$
Barranca .....	733 $\frac{3}{4}$	418 $\frac{3}{4}$
Mouth of the Potro .....	753	438
Mouth of the Morona .....	765	450
Limon .....	777	462
Punta-Achual .....	801	486

## RIO HUALLAGA.

Mouth of the Huallaga .....	619	304
Laguna .....	635 $\frac{1}{2}$	320 $\frac{1}{2}$
Santa Lucia .....	661 $\frac{1}{2}$	346 $\frac{1}{2}$
Santa Maria .....	716 $\frac{1}{2}$	401 $\frac{1}{2}$
Yurimaguas .....	742 $\frac{1}{2}$	427 $\frac{1}{2}$
Caina-rache .....	781	466
Rumi-Callarina .....	788	473

*Table of Magnetic Variations and Elevations above the sea.*

	Magnetic vari- ation of com- pas east.			Elevation in meters of river above the level of the sea.	
	°	'	"	M.	MM.
RIO AMAZON.					
Mouth of the Yavari .....	5	38	54	81	075
Letitea .....	5	7	40		
Loreto .....	5	11	24	87	171
Iquitos .....	5	56		89	914
Mouth of the Ucayali .....	7	2	0	96	924
Nauta .....	7	2		97	534
Santa Cruz de Parinari .....	7	27	20	106	983
Barranca .....	7	46	26	138	072
Punta-Achual .....	8	18	18	155	140
RIO HUALLAGA.					
Yurimaguas .....	7	47		134	109
Rumi-Callarina .....	8	8	10	148	130

## OBSERVATIONS ON THE CURRENTS.

*River Amazon.*

Between the mouth of the River Yavari and Tabatinga the current of the River Amazon has a velocity of four and six-tenths miles per hour.

Between Tabatinga and Letitea, three and three-tenths miles per hour.

Between Letitea and Loreto, three miles per hour.

Between Loreto and the port of Pebas, two and a half miles per hour.

Between Tigre and Iquitos, three miles per hour.

Between Iquitos and Tamshi-yacu, three miles per hour.

Between Tamshi-yacu and the mouth of the River Ucayali, the Amazon runs two and one-fourth miles per hour.

Between the mouth of the Ucayali and Nauta, three and one-fourth miles per hour.

Between Nauta and San Regis, three and a half miles per hour.

Between the mouth of the River Tigre-yacu and Santa Cruz de Paninari and Panirani, three and a half miles per hour.

Between Panirani and Vaca-marina, two and three-fourth miles per hour.

Between Vaca-marina and Elvira, two miles per hour.

Between S. Pedro and Fontevera, three and one-eighth miles per hour.

Between Fontevera and mouth of the Huallaga, three miles per hour.

Between the mouth of the Huallaga and Cedar island, three and two-tenths miles per hour.

Between mouth of the Pastaza and Barranca, the current runs three miles per hour.

Between Limon and Punta-Achual, three and three-fourth miles per hour.

*River Huallaga.*

Between mouth of River Huallaga and Laguna the current of the Huallaga runs two and one-half miles per hour.

Between Santa Lucia and Santa Maria the Huallaga has a velocity of three and one-fourth miles per hour.

Between Yurimaguas and Caina-rache the Huallaga runs three and one-fourth miles per hour.

Between Caina-rache and Rumi-Callarina this river runs three miles per hour.

IQUITOS, December 10, 1873.

*The Peruvian Exploring Commission, on board of Steam Launch Mario, to President of the Hydraulic Commission of the Amazon.*

IQUITOS, December 10, 1873.

SIR. — In compliance with your order of the fifteenth of September, ultimo, I embarked on board of the steam launch *Mairo*, along with the other members of the exploring commission, on the seventeenth, and started from Iquitos the same day for the mouth of the River Nanay.

#### EXPLORATION OF RIVER NANAY.

The unfavorable state of the weather preventing the determination of the astronomical position of this point, I proceeded next day to Lago Semilla and there took in wood. The River Nanay has a different aspect from the Ucayali, the most remarkable circumstance being in the entire absence of the timber called capviona, and in its place the abundance of caoutchouc trees, which produce gum-elastic, or *heve*. In the transit to this place we passed several huts inhabited by individuals occupied in collecting this remarkable gum. On the twenty-first we left Lago Semilla, and in two hours and a half passed the mouth of the River Pinto-yacu, on the right side of the river. There were a large number of Indians collecting turtles on the beach of the river.

The waters of the Pinto-yacu are of a yellow color, and communicate the same tint to the River Nanay, which it preserves far beyond its mouth. The distance of the Pinto-yacu to the mouth of the Nanay is eighty-five miles. Its banks are low and well wooded.

On the twenty-fifth we arrived at the extreme navigable point, distant from Pinto-yacu 105 miles, and from the mouth of the Nanay 195 miles. On the first of October, after making all the observations necessary, we left Pinto-yacu and anchored at the mouth of the Nanay at 10.30 P. M. On the third of October we proceeded toward Iquitos, and arrived there in two hours, against the current.

The Indians that dwell upon the banks of the Nanay belong to the tribe of the Iquitos. They are good looking and well made. They seem to be exempt from the cutaneous diseases that affect the tribes of the Upper Marañon and the Ucayali. They showed themselves friendly to the whites, with whom they trade and hire themselves to

aid in the fisheries and agriculture. The banks of the Nanay are high, and the climate good, being free from intermittent fevers and other such diseases.

The River Nanay is formed from the drainage of an immense extent of lowlands, and consequently has the temperature of its waters higher than that of the Amazon, from which circumstance it results that its rivulets and lagoons are literally covered with fish and turtles.

#### EXPLORATION OF THE RIVER ITAYA.

Having concluded the exploration of the Nanay, we set out from Iquitos on the thirteenth of October, for the River Itaya, and anchored in the port of Ablas (name of a farm), and having taken in wood, proceeded on the seventeenth, but found the navigation difficult in consequence of the great quantity of fallen trees that formed formidable palisades in the course of the river. These at last became so numerous that the exploration had to be given up after we had penetrated thirty-eight miles from the entrance.

This river, like the Nanay, is supplied by the waters from various lakes and lagoons formed at a considerable distance in the interior. The width at the mouth is sixty yards, and the current not strong. Its banks are generally low and become inundated in the winter season. There are very few inhabitants, and those live on small plantations near the entrance.

#### EXPLORATION OF THE RIVER POTRO.

On October twenty-seventh we left Iquitos in the steam launch *Mairo*, towards the River Potro, one of the affluents of the upper Marañon, and, after eleven days against the current, arrived at the mouth of said river on the eighth of November. Having cut and taken in wood, we began navigation, encountering many difficulties, caused by the innumerable palisades brought down by the current. Persevering, however, until a range of mountains came into view along the horizon, distant about six miles, and about forty-eight miles from the mouth, we came to some rapids, which might have been passed at the risk of upsetting. Deciding this to be the extreme navigable point, the attempt was not made. After the latitude and longitude were taken, we returned and anchored in the mouth of the river. This entrance is about 1,200 yards wide. The lands on both sides are exposed to be inundated by a rise of the river to twenty miles back from the mouth.

The navigation of this river was considered of importance, as a road is now actually being opened from Chachapoyas to its head-waters in order to facilitate communication with the Amazon. The lands about its head-waters are inhabited by savages, who are hostile to the whites and are opposed to the navigation of the river.

From the mouth to the point where the launch arrived no rocky formation could be seen, the head of the river being of white sand. The mean temperature of the air was 85° F., and of the water 72°.

#### EXPLORATION OF THE RIVER MORONA.

The expedition then proceeded to the exploration of the River Morona, another of the affluents of the Marañon. After having ascended thirteen miles up the Marañon, the entrance to the River Morona was reached. About three hours after leaving the mouth of the latter, that of the small River Amaya was passed on the right bank. It was reported that the banks of this river were inhabited by the Caguapan Indians, who follow the custom of compressing the heads of their victims by some method yet unknown. The banks of this river were found, like those of the Potro, subject to be inundated to a distance of twenty miles, more or less. On the sixteenth of November the examination was continued; but the current becoming stronger and the palisades increasing in numbers, although this river still had a depth of from three to four fathoms, it was decided as useless to go any further. No signs of natives were seen except an abandoned hut.

#### EXPLORATION OF THE RIVER PASTAZA.

The examination of the Pastaza was begun on the twentieth November. The width of this river equals that of the Marañon, but its course is full of shoals, which renders it, when its waters are low, impracticable even for canoes. The water rises and falls with great rapidity, and the steam launch got aground very often. It was reported that this river abounded in gold, but that all those who attempted to collect it had fallen victims to the Indians. The bed of the river is of black sand and the banks very low.

#### EXPLORATION OF THE TIGRE.

This river is wide and deep at all times of the year. From the twenty-fifth to the twenty-eighth were spent in ascending this river. On the twenty-eighth a place was come to where the margins of the



stream were high and perpendicular. The banks were composed of alternate strata of yellow, white and red clay. The marks on the trees showed that the river during its last increase had risen sixteen feet. The distance run was 104 miles, and the latitude and longitude were taken of the farthest navigable point.

This river possesses more natural advantages than any other tributary of the Marañon. Caoutchouc, or the *heve* trees, abounded, as well as copaiba, wax, copal, pitch and sarsaparilla. The woods abound in large animals, and the rivulets were full of turtle and fish. On the fourth of December last the steam launch arrived at Iquitos.

## ASTRONOMICAL POSITIONS DETERMINED BY THE PERUVIAN EXPLORING EXPEDITION.

DATES, 1873.	OBSERVED POSITIONS.	Latitude South.		Longitude West of Greenwich.		Longitude in degrees.	Current per hour.
		°	'	H. M. S.	H. M. S.		
September 22....	Mouth of the River Nanay.....	3	38	15	4 52 32	4 52 32	.....
24....	Mouth of the Pinto-yacu .....	.....	.....	.....	4 35 20	73° 36 0	.....
25....	End of navigation of the Nanay.....	3	43	20	4 56 36	74 9 0	1½ miles.
October 13....	Mouth of the Haya.....	5	44	15	4 52 30	73 7 0	1½ miles.
18....	End of navigation of the above.....	4	10	15	4 53 42	73 25 40	.....
November 11....	Mouth of River Potro.....	4	46	40	5 7 22	76 50 35	2 miles.
12....	End of navigation of the above.....	5	18	0	5 8 53	77 13 25	.....
15....	Mouth of River Morona.....	4	36	20	5 7 38	76 54 40	2½ miles.
19....	End of navigation of River Morona.....	4	6	0	5 7 40	76 55 3	.....
20....	Mouth of the Pastaza.....	5	6	28	5 5 22	76 20 35	2 miles.
26....	Mouth of the River Tigre .....	4	26	0	4 55 23	73 52 0	1½ miles.
29....	End of navigation of the River Tigre.....	3	38	40	5 2 12	75 34 0	.....

# EXPLORATIONS AND SURVEYS FOR A SHIP CANAL ACROSS THE ISTHMUS OF DARIEN.

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By **LIEUTENANT FREDERICK COLLINS, U. S. N.**

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WASHINGTON, D. C., *November 20, 1875.*

*To the Secretary of the American Geographical Society :*

MY DEAR SIR.—When I had the honor to appear before your learned Society a year or two since, I attempted to present a comprehensive view of the inter-oceanic canal question as it then appeared in the light of the latest information. Since that time important additions to our knowledge concerning two proposed routes have been made, and my duty as a Corresponding Member of your Society requires that I should acquaint you with the facts. It will not, however, be necessary that I should speak of the Panama route, since Commander Lull, by whom it was surveyed, is a Fellow of the Society, and will, without doubt, communicate to you the result of his investigations. I will, therefore, confine myself to a discussion of the route by way of the Atrato and Napipi rivers, giving you the results of the latest examination made by an expedition under my command during the winter just passed.

For a general description of the country in which this proposed route lies, I would refer to my paper of November, 1873 ; I wish now merely to describe its physical characteristics, as developed by our survey, and to discuss briefly the question of its adaptability to the construction of a ship canal. At the time of the reading of my paper, our knowledge of the country in the vicinity of the Napipi was confined to observations made from the river beds. All our surveys had been made in the beds of streams, and in projecting a canal line, it was assumed that the country for half a mile or so back from the river was the same as it appeared on the banks. More intimate knowledge shows such an assumption to be erroneous. The country that, from the river had appeared flat, was found to be covered with a net-work of hills. This fact is of great importance, as showing the difficulty of acquiring accurate information concerning those regions. It also shows how easily experienced men, anxious only to learn the truth,

may be deceived, and it enables us to enunciate the general rule that favorable reports concerning any route, not substantiated by actual surveys over the line itself, are worthy of little consideration.

In saying this I do not, by any means, wish to be understood as depreciating the value of surveys made in the beds of streams. On the contrary, I accord to such surveys very great value, and believe that preliminary reconnoissances in a country like Darien should always be so made. But, a most important distinction must be made in estimating the value of the results thus obtained, and for this reason: A survey in the bed of any stream naturally shows the *lowest possible profile* within the region drained by that stream and its tributaries.

If, therefore, such a survey shows an unfavorable profile, the question of the possibility of finding a favorable one anywhere within those limits is conclusively answered in the *negative*. But—and mark the difference—if such a survey shows a favorable profile, the question of the adaptability of the line is by no means settled in the *affirmative*. No ship canal can follow the windings of a mountain stream, and before any accurate estimate of the character of line the canal must follow can be formed, that line itself must be carefully surveyed from end to end.

The principles, then, to be borne in mind when called upon to judge of the value of explorations, are these: *Unfavorable* reports founded upon reliable surveys in the beds of streams, may be accepted without hesitation; favorable reports, with such foundation, can be regarded only as indicating the desirability of a more careful examination of the locality before judgment can be formed as to the merits of the route.

Furthermore, let me say, reports of favorable routes on the authority of “old Spanish maps or documents;” or from “conversations with the natives;” or of passes in the Cordilleras seen from either shore; or of lowlands seen from a height, or while passing up rivers; or of elevations determined by the velocity of streams, or the temperature of boiling water; or, in fact, by any thing except patient, laborious, and careful examination with instruments of precision; all such reports, I say, may be set down at once as a snare and a delusion.

Applying these principles to the results of the surveys of the past six years, we find that, as the result of surveys in the beds of streams, the various routes that have from time to time been proposed between the Panama railroad and the Napipi river,\* have been pronounced

\* With the exception of the *Truando route*, which has not been examined since the survey of Lt. Michler.

unfavorable — and this adverse verdict may be accepted as reliable beyond a doubt.

From a similar examination the Napipi route was pronounced favorable. This result should have been accepted simply as indicating the desirability of further surveys. It was altogether wrong to suppose that sufficient data had been acquired to justify the preparation of estimates of cost. The additional examination that has since been made has shown the character of the country to be essentially different from what we had been led by the previous surveys to suppose. Still, it is quite certain that it is the best of any south of Panama, at least. The fact that it is so poorly suited to the purpose is a sufficient index to the character of the others.

But let me proceed with a description of the country in that vicinity, which was my avowed purpose when I set out, but to which I have been long in coming.

Our survey followed the left or northern side of the valley of the Napipi, from the Atrato to the junction of the Doguado. At this point the line crossed the Napipi and followed the valley of the Doguado till opposite Chin-Chin bay, when it struck across the "divide" and descended to the Pacific in the valley of the Chin-Chin river.

In reference to the general topographical character of this region, I may say that our observations on the main line of survey, and in extended reconnoissances, showed its physical features to be wonderfully systematic. From the main divide, which skirts closely the Pacific coast, come down to the eastward long spurs or ridges which form the divides between the various westerly tributaries to the Atrato.

These ridges send off to the northward and southward smaller spurs, and these divide again and again till the whole country is over-spread with ranges of hills, running the one into the other like the veins on a leaf. A detached hill is rarely to be found. The crests of these ridges are usually very narrow, and their sides descend abruptly — often precipitously. These crests, rising and falling with gentle slopes, always afford good ground for walking. On this account they are used for roads or trails almost exclusively by the natives, they having long ago learned that the longer way around with a good road is a surer way home than the shorter, which, cutting across the ridges, presents a succession of steep and slippery hill-sides. They thus practically exemplify our proverb, if they do not put it into words.

Immediately along the line of survey the country naturally divides itself into four sections as regards its topographical features. First, there exists from the banks of the Atrato, for some five or six miles to the westward, a flat, swampy region of a lower average level than the banks of the adjacent rivers. During the wet months this region is frequently inundated to a considerable depth. During the dry seasons its more elevated portions become sufficiently dry to be passable, but those of a lower level always remain open-water swamps or miry morasses.

This portion of the route is in fact the delta of the Napipi, since it is bounded to the westward and northward, by a second mouth of that river called the Braso Muriel, while a third mouth, the Palmerito, flows through its central part. It includes in the portion near the Atrato, two large *ciénegas* or lagoons, which, during the wet months, are shallow lakes, but which become more or less dried up as the rains lessen.

The second topographical section extends from the Braso Muriel some six miles to the westward. It is characterized by the extension of the spurs of the divide between the Napipi and Opogado rivers to the very banks of the former, rendering it necessary to cross them continually with the survey. Extended reconnoissances were made to determine the practicability of flanking those hills by a detour to the northward, but in almost every case they were found to increase in altitude as they receded from the river, proving to be parts of the systems just described rather than detached hills that might have been flanked.

When, therefore, these hills butted on the river, there was no course left but to cross them, and our line through this section shows a succession of steep hills, the highest being 253 feet in elevation.

The third topographical section extends from the western limit of the second to the point at which the projected canal crosses the Napipi, near the junction of the Doguado and Merindo rivers. In this section the spurs or ridges terminate generally at 1,000 or 1,500 feet back from the river, and it was accordingly found possible to avoid them by keeping the line well down to the southward. Our profile, therefore, of this section, shows level or gently undulating ground, with no elevations of any considerable magnitude.

This section, in common with all except the first, is well covered with heavy timber, which appears wherever the ground loses its swampy character.

The fourth topographical section extends from the point of crossing the Napipi to the Pacific. It is characterized by being extremely broken, and by the great height of its ridges as compared with those of the other sections.

For the greater part of this section the line lies in the valley of the Dognado. The distance between that river and the Merindo is so small, and the divide between them is so high that the spurs extend almost invariably directly to the river banks. A line of survey carried up the valley anywhere except in the river bed, must cross these spurs continually.

In this section the main dividing ridge between the valley of the Atrato and the Pacific slope is found. It was crossed at an altitude of 778 feet, and so steeply does its western slope descend that the crest of the divide is only 7,000 feet in direct horizontal distance from the beach. The tunnel for passing under this ridge is three and one-half miles in length. The direct distance from the Atrato to the Pacific at Chiri-Chiri bay is about twenty-eight miles, but the introduction of curves required to follow the best ground has increased the actual length of the canal to thirty and one-quarter miles.

From the data acquired by the last expedition I have calculated the probable cost of a canal by this route, according to the general plan proposed by Commander T. O. Selfridge. This plan in its essential features is to follow the left or northern bank of the Napipi for about twenty miles to its junction with the Dognado. At that point the canal is to cross the Napipi by means of a dam of sufficient height, and then to follow the valley of the Dognado till the cutting becomes too deep to continue an open cut. A tunnel will then be resorted to to carry the canal under the dividing ridge and bring it out on the Pacific at Chiri-Chiri bay.

In the plan on which the following estimates are founded the summit level has been placed at 143 feet above mean tide, and twelve locks with a lift of one and three one-hundredths feet each on the Atlantic side and ten locks with a lift of fourteen and nine-tenths feet each on the Pacific will be required.

The canal is to be fed at the summit from the Napipi river, with its tributaries, the Dognado and Merindo, as well as from the next river to the southward, the Cnua, for which purpose a feeder three and two-tenths miles in length will be necessary.

The estimates include all the works supposed to be necessary for

the successful operation of the canal, and for its preservation and protection from accident by floods or otherwise.

The following dimensions have been assumed as best suited to meet the requirements of the case:

Width at bottom.....	72 feet.
“ water surface in earth cuttings.....	150 “
“ “ “ rock “ .....	124 “
Slope of side in earth cuttings .....	1½ to 1
“ “ rock “ below water.....	½ to 1
“ “ “ “ above water.....	¼ to 1
Width of top of embankments.....	9 feet.
Slope of embankments, exterior.....	2 to 1
“ “ “ interior.....	1½ to 1
Width of “bench” (at ten feet above water surface) .....	9 feet.
Width of locks, inside .....	60 “
Length of locks between miter-sills.....	400 “

For the tunnel calculations have been made with several different forms and dimensions. In the estimates given below a tunnel sixty feet wide at water surface, with thirty feet depth of water\* and eighty-six feet height above water has been allowed for. If a tunnel seventy feet wide should be considered necessary, the cost would be increased by about three and a half millions of dollars. In order to be on the safe side it has been assumed that the tunnel would require lining throughout with an arch of masonry.

The following prices have been allowed in computing the cost of the various portions of the work:

Excavation in earth.....	33 cents per cubic yard.
“ rock.....	\$1.25 to \$1.50 “
Excavation of tunnel.....	5.35 “
Arched lining of tunnel.....	2.00 “
Dredging.....	50 “
Hydraulic concrete for locks, culverts, dams, etc.....	7.00 to 8.00 “

As close a calculation of the amount of work of every kind as is possible with the data at hand, has been made, and the cost calculated at the above prices, with the following result:

\* The minimum depth of water in any part of the canal is to be twenty-six feet.



## ESTIMATED COST OF CANAL.

Excavation and embankment.....	\$28,697,398
Tunnel.....	33,241,923
Locks.....	5,049,214
Culverts.....	3,031 405
Tide drains.....	2,449,953
Dam for crossing the Napipi.....	616,057
Aqueduct for feeding canal from Rio Cuia.....	548,726
Division of rivers.....	1,670,159
Grubbing and clearing.....	191,900
Breakwaters at Chiri-Chiri bay.....	2,613,000
Improvements at mouth of Atrato.....	817,780
Light-house at each terminus.....	60,000
	<hr/>
	\$78,557,515
Add twenty-five per cent for contingencies.....	19,639,379
	<hr/>
Total estimated cost.....	<u>\$98,196,895</u>

Without entering into any comparison of this canal route with others that have been proposed, I present the following as the chief advantages and disadvantages of the Napipi route, according to the best of my judgment:

## ADVANTAGES.

1. Shortness of artificial channel required.
2. Good harbors. That on the Atlantic side is all that could be desired, while at the Pacific terminus there is deep water, with good holding ground, and the region is seldom visited by violent gales.
3. The cutting mainly in rock or stiff, tenacious clays. In such materials the amount of excavation can be reduced to a minimum; the clay will form stable embankments, and its impervious character will greatly reduce losses from leakage and filtration.
4. Proximity of the heaviest work to the Pacific, rendering transportation of labor, plant and supplies inexpensive.
5. The greater part of the work to be performed lies in a healthy region for the tropics.
6. Abundance of good timber for construction.
7. Absence of high winds along the canal line. Transit would be greatly impeded in any canal lying through a region of violent winds.
8. Freedom from liability to terrestrial convulsions of a nature likely to affect the permanency of the canal works.

9. Absence of large streams or of deep valleys to be crossed at a high elevation.

10. Friendly attitude of the inhabitants.

11. Fertility of the soil. With proper management the country in the vicinity of the line could be made to produce the greater part of the supplies required by the laborers.

#### DISADVANTAGES.

1. The necessity of resorting to a tunnel. This, while it is no doubt practicable, involves great expense in construction ; uncertainty in estimates of cost, and a probable increase in the difficulties attending transit, especially for large ships.

2. The steep descent of the Pacific slope, requiring the grouping of a large number of locks, and consequently increasing the liability to accident to the works.

3. Very heavy cuttings required in the valleys of the Dognado and Chiri-Chiri.

4. Limited water supply during dry seasons.

5. Liability to damage to the works from sudden floods. It is believed that this contingency is well guarded against in the accompanying plans, yet the liability to sudden and violent floods in a hilly country subject to excessive rains, cannot be overlooked.

6. Excessive rains likely to wash away embankments while in course of construction, and to interfere generally with the progress of the work.

7. Shortness and uncertainty of the yearly periods well suited to the work of construction.

8. Undeveloped state of the country and scarcity of native labor.

9. Remoteness from the great commercial centers of the world.

The above are all that have occurred to me with what attention I have been able to give the subject. Those accustomed to the contemplation and execution of great engineering schemes, will doubtless see many more on both sides, while it is quite certain that in the actual execution of the work many contingencies and complications will arise that the best minds will now be unable to foresee.

In concluding this letter it may not be inappropriate to present my views as to what general conclusions may be drawn from the results of the long series of explorations that have been perseveringly carried on during the past six years.

The main fact to be deduced is that the construction of a ship canal

between the Atlantic and Pacific oceans is to be a work of truly herculean proportions; a work involving the expenditure of much time and treasure in its execution, and demanding the exhibition of as great engineering skill as has been put forth in any work as yet accomplished by man.

The dreamy hope that has existed since the days when Columbus searched in vain for a natural strait, that somewhere among the gloomy fastnesses of the isthmus there might be found a place so exactly suited to the purpose that the construction of an artificial channel would be an easy task, must be regarded as forever dispelled.

Nature has not been so kind as to leave the gateway open, and when man shall essay the task he must be prepared to find his highest faculties and greatest energies taxed to the uttermost.

In fact, in view of the difficulty of constructing a canal, it does not appear to me improbable that the question of transit will be eventually solved by resort to some form of marine railway, by means of which ships with cargoes intact will be hauled overland from one sea and launched to continue their voyages upon the other. Such a project is by no means new, but the inherent difficulties which it presents have caused it to be kept in the background so long as any chance of finding a place well suited to the purpose of a canal existed.

But with the demonstration of the magnitude of the canal project, and the recent improvements in the raising of ships and in mechanical appliances generally, it is likely to assume greater importance. I have recently been informed that certain parties in New York are taking this matter into serious consideration, and if they will be able to insure the safety of ships while in transit, their project may be as likely to meet with favor as that of a canal involving locks and dams, or viaducts and tunnels, or other difficult engineering works.

The question as to which route presents the most favorable conditions to the construction, maintenance and successful operation of a ship canal involves so many considerations as to make its solution a matter of extreme difficulty. Without entering into any discussion of the relative advantages and disadvantages presented by each, I will say that, taking everything into consideration, and after the most careful deliberation, I am perfectly satisfied that the Nicaragua route presents more favorable, and fewer unfavorable, conditions than any of the others. The fact that this route is open to serious objection only goes to prove the remarks just made concerning the inherent magnitude of the projected task.

I believe that the construction of a successful ship canal through the Isthmus of Nicaragua, will be one of the most difficult enterprises that man has ever yet undertaken. Still, I am confident that it will be less difficult there than elsewhere, and with time, money and the highest order of engineering talent, it cannot be regarded as otherwise than perfectly practicable.

In regard to the possibility that a better route than any that has been examined, may have been overlooked, I would say that the explorations have been so conducted as to preclude such a possibility. In a country as densely wooded as is the one in question, it is practically impossible to cover every square mile of it with lines of survey; hence there will always be left a chance for interested parties to declare that had the last explorers gone a little farther to the north, or a little farther to the south, they would have found the exact spot desired. But the fact that the survey of the bed of a stream is fully competent to decide the unfavorable character of all the country, drained by it and its tributaries, has already been dwelt upon. It is, therefore, easy to see that, when all the principal water-courses have thus been followed up with unfavorable results, further search is not only unnecessary, but positively absurd.

I am aware of the fact that certain persons are loudly proclaiming that the government of the United States is politically opposed to the opening of a canal, and that all these explorations have been instituted for the purpose, and carried out with the idea, of demonstrating the impracticability of such an undertaking. I do not propose to enter into any controversy with persons capable of conceiving and publicly proclaiming such idiotic notions.

The good faith of the government and the honor of its officers do not need to be vindicated to its own citizens. And if people can be found elsewhere sufficiently simple to pin their faith to visionary enthusiasts or unprincipled adventurers, in preference to accepting the statements of responsible officers whose very position guarantees absolute truthfulness, we can well afford to let them do so.

Further surveys will greatly add to our knowledge of the topography of the various regions, and in the interests of geographical science it is to be hoped they will soon be made.

But they can result only in demonstrating the correctness of the general conclusions that have been drawn from those already made, and those who embark in them with any other hope will surely find

in the end that they have parted with their money to no other purpose than the demonstration of their own foolishness.

In a word, it may be said that no reasonable doubt can now exist that the data necessary to the determination of the most favorable place for the connection of the oceans by a ship canal have been secured.

Very respectfully.

FRED'K. COLLINS.

*Lieutenant, U. S. Navy.*

# NEW ZEALAND.

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By FRANK B. PASSMORE, C. E.

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New Zealand comprises three islands, called respectively the North and South islands and Stewart's island, and is situated in the South Pacific ocean, between the parallels of  $34^{\circ}$  and  $48^{\circ}$  south latitude, and the meridians of  $166^{\circ}$  to  $179^{\circ}$  east longitude.

It is distant about 12,000 miles from England (nearly at the antipodes) and some 1,200 miles to the south-east of Australia.

New Zealand was, as far as can be ascertained, first taken possession of by the Maoris about the beginning of the fifteenth century. The country was, however, unknown to Europeans until discovered by Tasman in 1642, after he had discovered Van Dieman's Land or Tasmania. On reaching the coast Tasman had an encounter with the natives at a place which he named "Murderer's Bay," but which is now known as "Massacre Bay," and is situated to the north-west of the South island.

It would appear that after this Tasman did not land, but continued his voyage, keeping along the coast. During this cruise he named some of the capes and bays.

In 1769 Captain Cook visited New Zealand and landed at Poverty bay. The reception he received does not appear to have been very friendly, but probably that was owing as much to fear on the part of the natives as any other cause.

The area of New Zealand is about 100,000 square miles, the North island being about 45,000 and the South island 55,000 square miles. The length of the North island is about 500 and its greatest breadth 250. The length of the South island 500 and its breadth 200 miles at the widest point.

The North and South islands are separated by Cook's strait (thirteen miles across at the narrowest point), while Foveaux strait separates the South island from Stewart's island.

The colony is divided into various provinces. The North island comprises the provinces of Auckland, Hawke's bay, Taranaki and Wellington; Auckland forms the north and Wellington the south of the

island, while Hawke's bay and Taranaki occupy a small portion of the east and west coast respectively.

The South island comprises the provinces of Nelson, Marlborough, Canterbury, Otago and Westland; Nelson lies to the north-west, Marlborough to the north-east, Otago occupies the south, and Canterbury the middle, except a narrow strip to the west, which forms the county of Westland.

Each of the above provinces has a separate government and distinct land, fencing and other laws. During the last session of parliament an act was introduced for the purpose of abolishing the system of provincial government, and this act will become law after the expiration of the next parliament.

The principal harbors are: In the North island, Bay of Islands, Auckland and the Thames in the Hauraki gulf, Taranaki in the Bay of Plenty and Napier in Hawke's bay, on the east coast; Kaipara, Manukau and Port Nicholson (Wellington) on the west. In the South island, Nelson in Blind bay, Picton in Queen Charlotte sound, Lyttelton harbor or Port Cooper (Port Chalmers, and the Bluff) in Otago, are the chief shipping places.

In Wellington there is a patent slip capable of receiving the largest sailing vessel that visits the port, and at Port Chalmers (the port for Dunedin) there is a fine stone paving dock, measuring 328 feet long, fifty feet wide, and with twenty-two feet of water on the sill. This is the only stone dock in the colony, but timbers have been felled for the erection of one in Auckland.

New Zealand is of volcanic origin, and the greater portion is very mountainous. The general direction of these mountains is from north to south. The highest peaks in the North island are Tongariro-Ruapehu (9,195 feet) and Mount Egmont (8,270 feet).

The South island is traversed by the southern Alps as a backbone. The highest peaks are Mount Cook, in Canterbury (13,200 feet), and Mount Franklin, in Nelson (10,000 feet).

Most of the peaks, especially in the North island, have been active volcanoes. Near Auckland there is a very fine crater, from the top of which more than twenty extinct volcanoes are visible.

The soil in the neighborhood of these craters is extremely rich.

Tongariro is even now occasionally in eruption. White island, in the Bay of Plenty, is at times active. Large deposits of sulphur, of varied colors, cover its sides, presenting a most beautiful appearance. There is a lake here, the waters of which are so strongly impregnated

with sulphuric acid as almost immediately to destroy any metal with which it comes in contact.

The chief rivers are : The Wairoa, in the north of Auckland, which flows south into the Kaipara harbor, and large vessels can go many miles up the stream ; the Waikato, which rises near Lake Taupo and runs through it, then in a northerly direction and joins the sea south of Maunk harbor ; the Thames, which rises in the Waikato district and flows north into the Hauraki gulf ; the Wauganni and Manawatu, which discharge themselves into Cook's strait ; the Hult, which flows into Port Nicholson ; the Avon, on which Christ Church is situated, and which, although small, is the most English-like of any in the colony, and is not subject to freshets as are most of the others ; the Waimakariri, the Waitaki, the Molyneux (which flows in a southerly direction into the sea at Molyneux bay) and the Mataura, which flows south into Toitoes bay in Foveaux strait.

Scarcely any fish is found in the New Zealand rivers ; but the acclimatization societies have introduced large quantities of salmon and trout ova. The latter seem to have succeeded well, but I have not heard of any well authenticated case of salmon having been caught.

The largest lakes are Lake Taupo, in the North island, which is about twenty miles in distance, and in the South island, lakes Wanaku and Wakatipu in Otago. There are smaller lakes, such as Lake Coleridge and Tekapo, in Canterbury.

In the Auckland province there are many wonderful geysers, hot lakes, sulphur springs, and pools of boiling mud. The waters are highly medicinal, and numbers of visitors frequent them in search of relief from long-standing rheumatic affections, and there are well authenticated instances of most marvelous cures.

The scenery in the neighborhood of Lake Roto Mahana is magnificent. On one side of the lake there is a geyser which has formed a series of white terraces, on which there are pools, of water of turquoise blue ; on the other side there are similar terraces of a pale pink color. As a rule the geysers are working, and the water flows over these terraces like fairy waterfalls. At times they are inactive. Birds, in their flight across this cauldron, are sometimes affected by the vapor and fall into it, when their bodies rapidly become incrustated, presenting an appearance of petrification.

New Zealand is very rich in mineral resources. The value of gold exported during 1874, amounted to £1,505,331. The chief gold fields are at the Thames, and in Otago and Westland.



Coal is worked in the north and south ; but many good mines are not opened up for want of means of transit. Railways are, however, being pushed on, and there is no doubt that, in time, New Zealand will not only be in a position to supply her own wants but will be able to export coal largely.

There are large deposits of rich iron ore, but these have not been worked, owing, in a great measure, to the scarcity and high price of labor.

Along several portions of the coast, but particularly at Taranaki, the shore is covered with an iron sand, and an attempt to convert this is being made. It was tried previously and failed ; but now furnaces and machinery have been erected at a large cost, and work will commence soon.

When in England, in 1874, I obtained an analysis of this Taranaki iron sand, which shows it to contain nearly sixty-eight per cent of iron. Very excellent results are obtained in England from titanite iron ore, which is, I think, exactly similar to the above, except that it is in lumps. I believe a very similar article is found in Canada. The analysis of the sand (of which I send a small sample) is —

	Per centage of metallic iron.		
Protoxide of iron .....	27.53	= 21.41	} 67.69 per cent.
Peroxide of iron .....	66.12	= 46.28	
Titanic acid .....	6.17		
	<hr/> 99.82 <hr/>		

The favorable climate and soil of New Zealand enable every fruit and flower that is produced at home to be grown here ; but owing to the want of frost in the greater portion of the colony during winter, many of the fruits have not such a fine flavor as in England.

Fern trees and ferns grow in great profusion and variety. Wild flax (*Phormium tenax*) abounds. A few years ago it was manufactured and exported to a considerable extent ; but a fall in the price very materially checked this industry. A factory has, however, been started for the purpose of making matting and paper from the plant. The matting is similar to the ordinary cocoanut matting, but is rougher in appearance. I am at present trying an experiment to determine the relative wearing qualities of the two materials. I have not heard of any paper of a superior quality having been made. A very good rope is manufactured from this flax, and I attach a report

of a series of experiments made by Captain Simpson, R. N., on board H. M. S. "Blanche." (Appendix A.)

New Zealand possesses a number of good timber trees. The largest of these is the kauri, which reaches the height of more than 150 feet, and is often eight to ten feet in diameter. It is a most valuable timber for ship building, and, in fact, for nearly every purpose. It only grows in the north of the North island.

It would be impossible in a short space like this to enlarge on the merits of the various woods; but I send a book containing reports on "the durability of New Zealand timbers," which gives the best information obtainable on this subject.

The native dog and cat are the only indigenous animals in New Zealand; in fact, the latter may almost be omitted, for I have never heard of one being caught of late years. The wild dogs are still very numerous, and make great havoc with the lambs on sheep runs. The large quantity of bush (in most parts of the North island particularly), affords ample shelter and security for these dogs.

There are no snakes in New Zealand, neither are there any insects with poisonous bite, except a small spider called the "katipo." There appear to be two kinds—one a glossy black, and the other black with a narrow red stripe or spot. They are found in sandy places and near rotten wood. In size they are about a quarter of an inch in diameter, and sometimes more. Their bite has the effect of causing immense swelling and great lassitude, and it is thought that death would follow in some cases unless attended to.

In former years the moa, a gigantic bird of the ostrich tribe (ten or eleven feet high), must have been common in New Zealand, but it has long since disappeared. Several very perfect skeletons have, however, been found. Pheasants have been introduced and thrive well; in fact, they are now plentiful over the whole colony. California quails and partridges have also been imported, but the result has not been satisfactory. The skylark appears to thrive better in the colony than at home, and I have frequently seen a flock of twenty or thirty in the air singing at the same time; whereas in England I do not remember seeing more than one or two together. Most of the English birds have been introduced with more or less success. Wild ducks are found in great abundance during the winter.

The climate of New Zealand varies considerably between the north and south. During 1874, the maximum temperature in the shade ranged from 75° to 95° Fah., and the minimum from 23° to 37° Fah. The rainfall during the same period varied from twenty-three to

seventy-one and a half inches. (This does not include observations taken at Bealey and Hokitika, where the rainfall was ninety-eight and 104 inches respectively.)

The climate of New Zealand is healthy, and as a rule agreeable. Owing to its position it is subject to frequent high winds. The prevailing breezes are from the north-west and south-west, but the winds from the south-east are the coldest and most trying. The population of New Zealand is composed of two classes, the Maori and European. It is believed that the Maoris first visited and settled in New Zealand about the fifteenth century. They were a brave and warlike people, and built their villages or "pahs" on elevated ground, in the fortification of which they showed considerable skill. Like all other savages they were cannibals, but this practice has disappeared with the advance of civilization. The Maoris are, as a rule, well built, strong men; the average height is about five feet seven inches. The skin is olive brown, and the hair coarse and black. The old men were very handsomely tattooed, and the women have the lips and chin marked, but the practice is dying out.

The Maoris are good agriculturists, and in many parts use all the improved implements of their more civilized neighbors. As a race they are remarkably intelligent. They generally assume the European garb, and many of them speak very good English. I was astonished when visiting some Maori schools to see how well the children wrote and spelt our language. The Maori race is dying out, which is in a great measure to be accounted for by the fact that since they have mixed so much with the Europeans, they have learned low European habits, and smoke and drink to excess. They have abandoned their dwellings in the hills, and have often settled themselves in low swampy ground, and of course the result has been disease and death.

The Maoris were divided into several tribes. The "Ngapuhi" appear to have been the first to embrace civilization, and in February, 1840, the chiefs met near the "Waitaui" (weeping waters) and were the first to sign the famous treaty by which the natives acknowledged themselves to be subjects of the queen. I attach a fac-simile of this treaty.

The approximate number of Maoris in New Zealand is 48,470, of these some 3,000 are in the South island and the remainder in the North. The Maoris are represented in parliament by their own members, and their anxiety for the construction of roads and works

would seem to indicate that the old feelings of rebellion have died out, and that they wish to join in the general advancement and prosperity of the country. I inclose a few photographs. Space would not permit of my giving any detailed account of the last unfortunate Maori war, but I attach a map showing approximately the loyal and disaffected districts in 1869.

The European population of New Zealand, in 1874, was about 341,800. The government gives free passages to all suitable immigrants, and during 1874 some 22,000 arrived. These new arrivals are absorbed as soon as they are landed. A week or two after the arrival of an immigrant ship it would often be impossible to notice that any addition had been made to the population. The great demand for labor consequent on the large amount being spent on public works, has had the effect of raising wages most materially, as will be seen by the accompanying statement (Appendix B), which shows the gradual rise from time to time. This return only shows the rise at Auckland, where labor is cheaper than in many other places, but a corresponding increase has taken place over the whole colony. With the rise in wages the price of provisions has followed, and many articles of consumption are at the present time seventy-five and 100 per cent dearer than they were two years ago.

Almost every religious body is represented in New Zealand. No State aid is given to any denomination, but education is suitably provided for. The government gives assistance to some 547 schools, which show 38,714 pupils on the books. In addition to these there are numbers of private schools, but it appears difficult to obtain as good instruction for children, especially girls, as can be obtained in older colonies. At Wellington, Christ Church and Dunedin colleges have been established with very gratifying results.

The chief agricultural industry of New Zealand is the growth of wool. The following will show the extent of cultivation in the islands in February, 1875:

	Acres.
Land broken up, not under crops.....	154,888
Land under grain crops .....	279,451
Land under green and other crops.....	74,832
Land in sown grasses .....	1,434,982
Total.....	1,943,653

The average yield per acre was: Wheat, twenty-eight bushels; oats, thirty-five bushels; barley, twenty-nine and one-half bushels; hay, one and one-fourth tons; potatoes, five tons.

The telegraph system in New Zealand is very complete. At the end of 1874, there were 2,632 miles of line open, representing 5,284 miles of wire. With the exception of a break of thirty miles between Opunaki and Stony river, in the province of Taranaki, south of New Plymouth (where the line would have to pass through native land, to which the owners object), every town of importance is connected by télégraph. During 1874, there were 724,582 private messages sent, representing £50,628 8 1, and the government sent 119,719 messages, which, at the rates charged to the public, would amount to £12,694 2 9. The tariff for messages is the same to any part of the colony. Ten words are allowed free for the address and signature. The first ten words cost one shilling and every additional word one penny. Press telegrams are sent at half these rates between 8 A. M. and 5 P. M. Between 5 P. M. and 8 P. M., the evening rate for press telegrams is, for the first twenty-five words, six pence, and for every additional twenty-five words or fraction thereof, three pence. On arrival of an Australian or San Francisco mail, press telegrams of 200 words can be sent at evening rates. All rates are double on Sunday. A submarine cable connects the North and South island. This is worked on the duplex system. Arrangements have been made with a company in England to connect New Zealand with Australia by submarine cable. The work will be executed during the present year.

There are no imperial troops in New Zealand, but there are various volunteer corps in each province making on the whole,

		Men.
Artillery .....	9 corps with a strength of.....	459
Cavalry .....	16 corps with a strength of.....	587
Engineers.....	2 corps with a strength of.....	107
Rifles .....	70 corps with a strength of.....	2,907
Naval .....	4 corps with a strength of.....	296
Cadets.....	33 corps with a strength of.....	1,108
Total.....	134 corps with a strength of.....	5,464

On the 31st December, 1874, there were twenty-two fire brigades in the various towns, numbering 639 officers and men.

I have before mentioned that Tasman and Cook were the first to visit New Zealand. The latter urged on the English government the

advisability of colonizing the island, as also did Benjamin Franklin, the American statesman, but the government took no steps to accomplish this object. In 1837, a company called "The New Zealand Company" was formed for the purpose of colonizing the country, and the first party left England in May, 1839, under the command of Colonel William Wakefield. They selected Port Nicholson as the site of the first settlement, and the first batch of immigrants landed in 1840. This settlement is "Wellington," the present capital. Auckland was established in 1840 by Captain Hobson, R. N., who arrived, in January of that year, to occupy the position of lieutenant-governor under Sir George Gipps, governor of New South Wales, of which colony New Zealand was a dependency.

In May, 1841, New Zealand was declared a separate colony, and Captain Hobson was made governor. Auckland remained the seat of government until 1865.

New Plymouth (Taranaki) was settled in 1841 by the "New Zealand Company," and Nelson was founded in the same year. Otago was settled in 1848 under the auspices of the Church of Scotland.

Canterbury was founded in 1850 with the assistance of the Church of England party. Hawke's bay (formerly a portion of the Wellington province) became a separate province in 1858, and Marlborough separated from the province of Nelson in 1860. Westland was bought from the natives in 1861.

The above will show how very recent the public-works scheme of this colony must be. The public-works statement presented to parliament by the Minister for Public Works last session will show the position of affairs up to June, 1875. I attach a copy.

The first railways were constructed in Canterbury. Both that province and Otago have made railways out of provincial funds, but with these exceptions the whole of the railways have been constructed by the general government, who have also made the greater part of the railways in the above-named provinces. The general government railways are made under the immigration and public-works act of 1870.

On the 30th June, 1875, there were opened for traffic:

Made by the general government	} in the North island, 78½ miles. " South " 199½ "
Made by the provisional government	
	73 "
Total	351 miles.

Since that period several new drives have been opened, as well as extensions to those previously worked.

With the exception of the lines in Canterbury and Otago which are leased to the provincial government, all the railways are worked by the general government, under the superintendence of the writer.

All the general-government railways are made three feet six inches gauge, except some twenty miles in Canterbury. The provincial lines in Otago and Canterbury differ in gauge, but the former and a portion of the latter are being altered to three feet six inches.

Owing to the hilly nature of the country (except in Canterbury, where the east coast is a vast plain), the railways are made with steep gradients and sharp curves. Gradients of one in forty are very common. The steepest grades are one in thirty-three; but I must except a length of some two miles, not yet open, which, in order to get over the Rinutake range, will rise with a gradient of one in fifteen. This, however, will be worked on the Tell system. Curves of five chains radius are the sharpest used except in a few cases, where curves with four and a-half chains radius have been introduced for special reasons. I attach a map of the two islands, which will show the railways already opened and those in course of construction.

The general government are providing water for the use of the gold fields. When the work is completed there will be nearly 100 miles of water races.

Roads are being made and improved in all directions. The progress of the public works has not been as rapid as might have been, but this is owing to the great scarcity of labor, and it was not thought advisable to draw the labor from other industries, which would have been the inevitable result had the work been pushed on faster.

It is estimated that the average cost of our railways will be between £6,000 and £7,000 per mile, and, considering the nature of the country and the price paid for labor, if the result is obtained it will reflect infinite credit on the engineer-in-chief who has so ably managed this large system of work. In order to find funds to carry out these public works, money has been borrowed at various times. The sums already raised and authorized to be raised amount to £19,380,906. This is apparently a heavy debt for so young a colony; but such a large portion of the money has been judiciously expended in reproductive works, that the result cannot be other than satisfactory. I attach the financial statement presented to the last parliament by the colonial treasurer.

The shipping of 1874 showed a marked increase over that of previous years. During the year there entered 856 vessels, representing 399,296 tons, and the crews of these vessels numbered 15,924. During the same period there cleared 822 ships, representing 385,553 tons, with crews numbering 14,225 hands. This does not include coasting traffic, which represents about 1,353,085 tons, conveyed by 14,350 vessels, employing 118,143 hands.

The total value of imports during 1874 amounted to £8,121,812, for which £1,188,951 16 7 was received in duty. The total exports during 1874 amounted to £5,251,269, of which wool and gold formed the greater portion. There were 46,856,012 pounds of wool shipped, valued at £2,832,008, and 376,388 ounces of gold, valued at £1,505,331. The imports per head of population (excluding Maoris), was £23 15 2. The exports per head was £15 7 3.

The postal service of the colony is very complete. The rates of postage (not exceeding one-half ounce) on town letters, is one penny, and on letters for any part of the colony, two pence. Newspapers one-half pence for town delivery, and one penny for any other part of the colony. During 1874, 3,753,635 letters were received from places within the colony, and 585,530 letters from places outside the colony, making a total of 4,339,165, or about thirteen letters per head of population, excluding Maoris. During the same period 4,129,585 were dispatched to places within the colonies, and 589,706 letters to places outside the colonies, making a total of 4,719,291, or about fourteen letters per head of population; 3,872,668 newspapers were received, and 2,434,024 were posted during the year. The postal revenue for the year was £104,371 2 11, or equal to 6s. 1½d. per head of population. At the end of 1874 there were 103 post-office savings banks open, 52,627 deposits, value £699,249 14 3, had been received, and 29,778 withdrawals, value £620,155 8 9, were made during the year. The cost of management was £2,250, equal to six and five-ninths pence for every withdrawal and deposit.

Not much has been done in New Zealand in the way of manufacture. On the Wairoa river a factory has been created for the manufacture of matting and paper from flax. In Auckland there are glass works, rope walks and soap works.

In most of the principal towns sash-and-door factories are established as well as engineering shops capable of turning out a considerable quantity of work; but all the raw material and machinery have to be imported.



In Nelson and Otago cloth factories have been established with marked success.

I have sent samples of colonial tweed to England, where it has been pronounced by an expert as superior in quality to any manufactured at home. It is, however, somewhat wanting in "finish" but this only requires time to perfect.

Saw mills are scattered all over the country where there is timber.

Breweries are to be found in nearly every town of any pretensions, and the beer and porter brewed is considered of excellent quality.

There are ship and boat-building yards in all the chief ports; but I think Auckland excels in this industry.

There are several tanneries; but no bark has yet been found equal to that used at home and the result is that the colonial leather (unless made with imported bark) is inferior to the imported article.

Fish curing affords employment to a small number of the community, as also does meat preserving.

Potteries and tile works have been started in several places; but I think nothing beyond common ware has been produced.

There are several coach factories; but the work executed generally seems wanting in finish. There is a great want of skilled labor in the colony and what labor there is fetches a high price. Labor saving machinery has been but little introduced; yet I know of no country where it is more urgently required, or could be introduced to greater advantage.

The resources of New Zealand are great, and I make no doubt that there is a great future in store for this "Britain of the South," but this result can only be obtained by steady perseverance, and by making use of every opportunity to develop the mineral wealth and make the colony a manufacturing country.

## APPENDIX A.

## NEW ZEALAND FLAX ROPE TESTED.

*Report of result of trial of New Zealand Phormium with English Rope.*

H. M. S. BLANCHE, WELLINGTON, 20th October, 1874.

SIR.—In compliance with your order of 30th September, 1873, relative to the trial of New Zealand phormium, I have to report that as the ship was such a short time at sea, during the first three months that the rope was rove for trial, I deemed it desirable to give it a further trial of three months before reporting upon it. A detailed report of all rope rove is given in the attached form, the general result of the trial in my opinion being that the fiber of the New Zealand rope, when subjected to a direct and steady strain, is stronger than that from which navy rope is made, but that it is more brittle and more easily broken if “kinked,” and that its great inferiority to the navy rope through its stretching and swelling is, beyond this, due almost entirely to its manufacture.

I am, etc.

(Signed.) C. B. SIMPSON, *Captain*.

Commodore JAMES G. GOODENOUGH, *Senior Officer*.

*Report on New Zealand Ropes manufactured at Auckland, and tried on board H. M. S. "Blanche," against Naval Ropes of corresponding size. Date of trial, between April and October, 1874.*

ROPE ROVE.	DIRECTIONS.	Size on May eighteenth, at about 30 hours' rain.	Size on June seventeenth, at about 30 hours' rain.	THIRTY JULY.		THIRTY-FIRST AUG.		Number of yards in navy rope.	Number of yards in New Zealand rope.
				Maxim. measurement.	Minim. measurement.	Maxim. measurement.	Minim. measurement.		
Outters' falls.....	3½ in.	4 in.	4 in.	4½ in.	3 in.	4½ in.	3 in.	abt. 100	80
Preventer main-brace.....	3½	4½	4½	4½	3	....	....	....	....
Fore lift.....	3½	4	4	....	....	....	....	....	....
Fore brace.....	3½	4	4	4	2½	4½	3	....	....
Foretop-sail sheet-whip.....	3½	4½	4½	4½	3	....	3	....	....
Mizentop-sail sheet-whip.....	3½	4	4	4½	2½	....	....	....	....
Luff fall.....	3	3½	3½	4½	....	....	....	....	63
Galley's fall.....	3	3½	3½	3½	2½	4½	2½	93	....
Foretop-gallant sheet.....	3	3½	3½	....	....	....	....	....	....
Maintop-gallant sheet.....	3	3½	3½	....	....	....	....	....	....
Foretopmast-staysail sheet.....	3	3½	3½	....	....	....	....	....	....
Foretop-sail reef-tackle.....	2½	2½	2½	....	....	....	....	60	39
Cross-jack brace.....	2½	2½	2½	....	....	....	....	....	....
Dingy fall.....	2½	2½	2½	....	....	2½	2½	....	....
Main-truss fall.....	2½	2½	2½	....	....	....	....	....	....
Lower boom topgallant-lift fall.....	2½	2½	2½	....	....	....	....	....	....
Forecastle jigger.....	2½	2½	2½	....	....	....	....	....	....
Quarter-deck jigger.....	2½	2½	2½	....	....	....	....	....	....

N. B.—Naval 3¼ inch numbers as much as 126 yards. Ninety-nine was the number in place tried against New Zealand rope.

## REMARKS.

July 8. — When about to proceed to sea, cutter falls were considered hardly safe, but left rove.

July 10. — All the much used ropes appear to be hurt by the sheaves more than the naval ropes. They became much chafed and very rough; also many of the yarns show themselves to be slacker than the rest of the rope, and some became kinked.

July 11. — Tried which would carry away first, naval two and a-half inch or New Zealand two and a-half inch. Latter did before the other was even well stretched. Then tried naval two and a-half inch against New Zealand three and a-half. Former carried away.

July 13. — Main-topsail sheet-whip had to be turned end for end in consequence of being so frayed out and chafed where it led through the main-bits by the hauling, and was so swollen that it would hardly reeve through the blocks and bits.

Tried, thirteenth July, three and a-half inch of New Zealand rope against three inch of naval. Latter carried away. Then three and a-half inch against three and a-half inch. New Zealand carried away. In trying the rope the New Zealand stretched so much, because so very small, and was so extremely oily that it was with difficulty the ends could be secured, the only way being knotting behind the seizings. If hitched, it always carried away in the hitch, even though a round turn had been taken around the toggle, and nearly in all cases it carried away when one part was over another.

In the case of the preventer main-brace, main-topsail sheet, and fore-brace, it was found impossible to stopper them from their smoothness and oiliness.

August 31. — The galley's and cutter's falls were considered unsafe, and were therefore unrove. The rope was very much frayed out, and many yarns kinked and broken, and the strands stretched nearly straight. All naval rope rove at same time in good working order.

Dated on board H. M. S. "Blanche," WELLINGTON, *October* 30, 1874.

(Signed) WALTER B. BRIDGES, *Senior Lieutenant.*  
H. W. CAMPION, *Navigating Lieutenant.*  
P. HOLLAND, *Boatswain, First Class.*

Approved:

(Signed) C. B. SIMPSON, *Captain.*

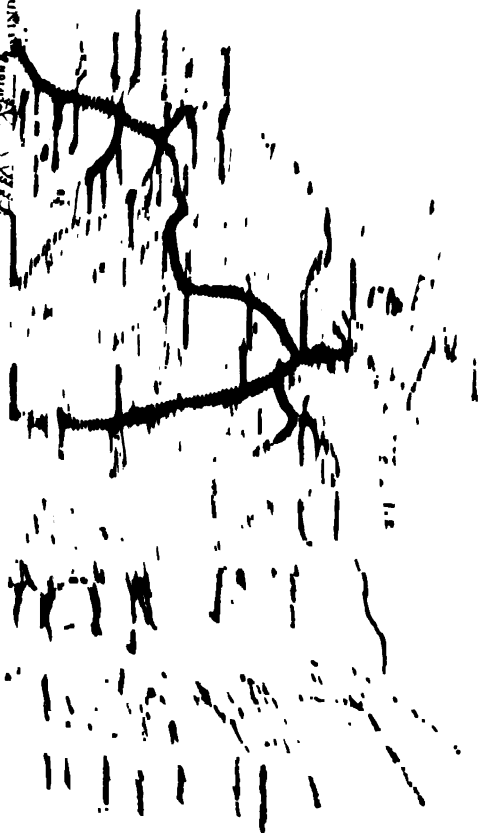
# APPENDIX B. NEW ZEALAND RAILWAYS.

Table showing Wages and cost of Material, at Auckland Agency, each six months, from June 18, 1872 to June 30, 1875.

	Carpenters' foreman.	Carpenters.	Carpenters' mates.	Masons' foreman.	Masons.	Blacksmiths.	Strikers.	Engine drivers.	Firemen.	Brakemen and Police-men.	Engine cleaners.	Engine fitters.	Carriage fitters.	Benchmen.	Inspectors.	Gaugers, walking.
From June 18 to December 31, 1872.....	£ d. 10 00	9 2	7 00	£ d. 11 00	£ d. 10 00	9 6	7 00	9 6	6 00	7 00	6 00	9 00	9 00	7 00	11 00	9 6
January 1 to June 30, 1873.....	10 00	9 2	8 00	11 8	11 00	9 6	7 00	9 6	6 00	7 00	6 00	9 00	9 00	7 00	11 00	10 00
July 1 to December 31, 1873.....	11 6	9 6	8 00	13 4	12 00	10 00	7 00	11 00	7 00	7 00	6 00	9 00	9 00	7 00	13 4	10 00
January 1 to June 30, 1874.....	12 00	10 00	9 00	13 4	12 00	10 00	7 6	12 00	8 00	7 00	6 00	9 00	9 6	7 00	13 4	12 00
July 1 to December 31, 1874.....	12 00	10 00	9 00	13 4	12 00	11 00	7 6	12 00	8 00	7 00	6 00	9 00	10 00	7 00	13 4	12 00
January 1 to June 30, 1875.....	12 00	10 00	9 6	13 4	12 00	11 00	7 9	12 00	8 6	8 00	6 00	9 00	10 00	7 00	13 4	12 00
Average rate.....	11.08	9.66	8.45	12.76	11.06	10.15	7.98	11.05	7.95	7.01	6.00	9.00	9.04	7.00	12.63	10.95
Average increase per cent.....	13.00	5.35	20.71	16.00	16.00	6.84	4.00	16.31	20.83	1.42	.....	.....	4.44	.....	14.81	15.96
Increase per cent present over original.	20.00	9.17	36.71	21.18	20.00	15.78	10.71	26.31	41.66	14.88	...	...	11.11	...	21.18	26.31

## APPENDIX B—NEW ZEALAND RAILWAYS—(Continued).

	Gaugers.	Repairs.	Horse drivers.	Labourers.	Storekeeper.	Storeman.	Clerks.	Timekeeper.	Watchman.	Nippers.	Messenger.	Stalayers.	Quarrymen.	Bricklayers.	Tide-work labourers.	Sawyers.
From June 18 to December 31, 1873....	7 6	6 6	7 00	5 6	9 00	9 00	6 00	6 00	6 00	1 6	5 10	8 4	8 00	10 00	7 6	7 00
January 1 to June 30, 1873.....	7 6	6 6	7 00	6 00	9 00	9 00	6 6	7 00	6 00	1 9	5 10	8 4	8 00	10 00	7 6	7 00
July 1 to December 31, 1873.....	10 00	6 6	7 00	6 6	10 00	9 00	8 00	8 00	6 00	2 00	6 6	11 00	8 00	10 00	7 6	7 00
January 1 to June 30, 1874.....	10 00	7 6	7 00	6 6	10 00	9 00	8 00	8 00	6 6	2 00	7 00	11 00	8 00	10 00	8 6	7 00
July 1 to December 31, 1874.....	10 00	7 6	7 00	6 8	10 00	9 00	8 00	8 4	6 6	3 00	7 00	11 00	8 00	10 00	8 6	7 00
January 1 to June 30, 1875.....	10 00	7 6	7 00	7 00	10 00	9 00	8 00	8 4	7 00	3 00	7 00	11 00	8 00	10 00	8 6	7 00
Average rate.....	9.15	7.00	7.00	6.33	9.07	9.00	7.03	7.07	6.03	2.02	6.55	10.02	8.00	10.00	8.00	7.00
Average increase per cent.....	22.00	7.69	.....	16.00	7.77	.....	26.00	26.33	5.00	46.66	12.35	22.45	.....	.....	6.66	.....
Increase per cent present over original.	40.00	15.33	.....	27.27	11.11	.....	33.33	26.33	16.66	100.00	20.00	33.05	.....	.....	13.33	.....



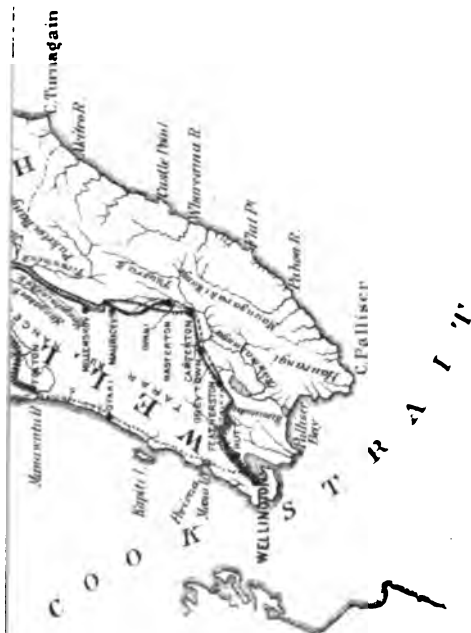




# NORTH ISLAND

—OF—

C. Maria  
van Deun  
North C.



U.S. GEOLOGICAL SURVEY

